

PERSON-LEVEL SAMPLING WEIGHT CALIBRATION FOR THE 2000 NHSDA

Contract No. 283-98-9008
RTI Project No. 7190

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Prepared for:

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Rockville, Maryland 20857

Prepared by:

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Research Triangle Park, North Carolina 27709

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Preface

This report contains a brief review of the weight calibration methodology used for the 2000 National Household Survey on Drug Abuse (NHSDA) and a detailed documentation on the implementation steps and evaluation results from its application to the survey data. The constrained exponential modeling method used in NHSDAs prior to 1999 was modified (referred to in this report as GEM or the generalized exponential model) in order to have more flexibility in dealing with the extreme weights internally and to be able to directly set bounds on the weight adjustment factors so that they become suitable for nonresponse and poststratification adjustments. The highlights of the new method are summarized below.

- The inherent two-phase (viewing the large screener sample as first phase and the actual questionnaire sample as second phase) nature of the NHSDA design allows the additional step of poststratification of the selected persons to estimated controls from the large first-phase sample of persons in order to get stable controls for the following step of nonresponse adjustment at the respondent person level. As a compromise, these two steps were combined into one step in NHSDAs prior to 1999. However, from the 1999 NHSDA onward, the two steps were kept separate.
- Another poststratification step at the respondent household level in the first phase of the screening interview was added. This step reduced coverage bias resulting from the first-phase sampling, as well as produced controls for use in poststratification at the selected person level, respondent person-pair level, and respondent household level in the second phase of the drug use interview. This step again takes advantage of the inherent two-phase design.
- The built-in control on extreme weights in the GEM was supplemented by a separate step of extreme weight adjustment after the final poststratification whenever the extreme weight proportion in the initial unadjusted weights was deemed to be considerable. This was accomplished again by using the GEM such that the sample demographic distribution was preserved. This method represents an enhancement over the trimming method implemented before the nonresponse adjustment used in NHSDAs prior to 1999, and the extreme weight adjustment before the nonresponse adjustment used for the 1999 NHSDA.

The GEM calibration method provides a unified approach to handling problems of extreme weights, nonresponse, and poststratification, and it uses current state-of-the-art technology. The implementation of GEM under a tight project schedule was a challenge, but it was met successfully by the diligence and perseverance of the members of the weighting team consisting of Patrick Chen, Harper Gordek, Matthew Westlake, Steven Emrich, and Michael Penne.

This report consists of several chapters describing the implementation and evaluation of the GEM with appendices comprised mostly of tables. In the interest of reducing the size of the report, detailed domain specific evaluation results are presented in the supplement to this report,

which is available upon request. It was prepared for the Substance Abuse and Mental Health Services Administration (SAMHSA), Office of Applied Studies (OAS), by the Research Triangle Institute (RTI), North Carolina, under Contract No. 283-98-9008. The authors are grateful to Art Hughes of SAMHSA and Ralph Folsom of RTI for their useful comments and suggestions.

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LIST OF TERMS AND ABBREVIATIONS

DU Dwelling unit.

ev Extreme value. See section 4.1 for more detail.

GEM Generalized exponential model. See Chapter 2 for more detail.

half-step This refers to halving the increment in the Newton-Raphson iterative process for fitting GEM.

IQR Interquartile range.

nr Nonresponse.

Outwinors Signifies the extent of removed weight after extreme value treatment via winsorization.

ps Poststratification.

res.sdu.nr Respondent screener dwelling unit nonresponse adjustment step. See section 5.1.2 for more detail.

res.sdu.ps Respondent screener dwelling unit poststratification adjustment step. See section 5.1.3 for more detail.

res.sdu.ev Respondent screener dwelling unit extreme value adjustment step. See section 5.1.4 for more detail.

sel.per.ps Selected person poststratification adjustment step. See section 5.2.2 for more detail.

res.per.nr Respondent person nonresponse adjustment step. See section 5.2.3 for more detail.

res.per.ps Respondent person poststratification adjustment step. See section 5.2.4 for more detail.

res.per.ev Respondent person extreme value adjustment step. See section 5.2.5 for more detail.

sandwich SE Sandwich standard error. See Section 6.5 for more detail.

SE Standard error.

SES Socio-economic status indicator. See Exhibit 3.1 for more detail.

UWE Unequal weighting effect. It refers to the contribution in the design effect due to unequal selection probability and is defined as $1 + ((n-1)/n) * CV^2$ where CV = coefficient of variation of weights.

Winsorization A method of extreme value treatment that replaces extreme values with the critical values used for defining low and high extreme values.

Chapter 1. Introduction

The National Household Survey on Drug Abuse (NHSDA) design changed in 1999 from a single national survey (with California and Arizona supplements) to a statewide survey that includes 50 States and the District of Columbia. Henceforth, this will be referred to as the 51-State design. The target population includes civilian, noninstitutionalized persons aged 12 or older. The main reason for the change was to be able to produce more efficient and direct State-level estimates, which could be further improved using small area estimation (SAE) techniques. To meet the required precision at the State level, there was a considerable increase in the total sample size from 25,500 in 1998 to a planned size of 67,500 beginning in 1999. This large sample size would allow the Substance Abuse and Mental Health Services Administration (SAMHSA) to continue to report drug use estimates for demographic subgroups at the national level with adequate precision without the need to oversample specially targeted demographic subgroups as has been required in the past. For the 2000 survey as in 1999, eight States (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas), referred to as the "large" States, have a sample designed to yield 3,600 to 4,630 respondents per State, while the remaining 43 "small" States have a sample designed to yield 900 to 1,030 respondents per State. In addition to the originally planned 67,500, a youth supplement sample (2,500 youths aged 12 to 17 years) was taken in 1999 and 2000 to increase the precision of smoking-related estimates for youths at the national level (see Bowman, Penne, Chromy, & Odom, 2002). For the 2000 NHSDA, which followed the 1999 design plan, the total realized sample size was 71,764 persons (corresponding to 55,924 dwelling units [DUs] selected at the second phase out of 169,769 DUs screened at the first phase), with a low of 828 for Wyoming to a high of 1,200 for New Jersey among small States, and a low of 3,478 for Florida and a high of 5,022 for California among large States.

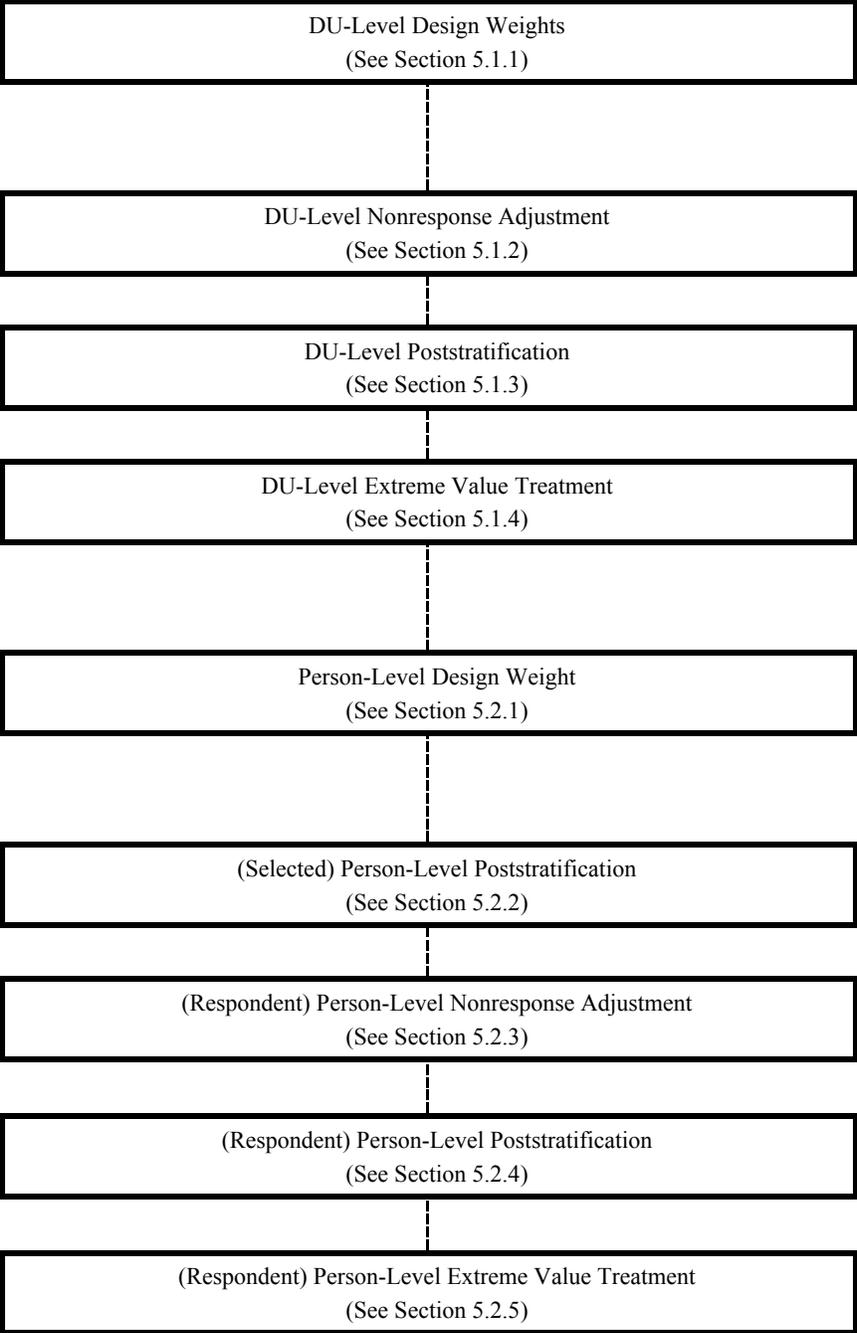
In the NHSDA design, States serve as the primary strata, and field interviewer (FI) regions within each State serve as secondary strata. In the small States, 12 FI regions are created, while in the large States, 48 FI regions are formed. Segments within FI regions form first-stage sample units drawn with probabilities proportional to composite size measures using Chromy's algorithm (Chromy, 1981; Williams & Chromy, 1980). DUs within segments form the second-stage units that are drawn according to a random systematic scheme with an EPSEM (equal probability selection method) goal. Within each FI region, segments are formed to contain a minimum of 175 DUs. From each FI region, two segments are drawn per quarter for a total of eight segments per year. On average, about 30 DUs are selected per segment with an objective of 10 completed person-level interviews. This average of three selected DUs per completed person interviews reflects various levels of attrition, such as DU eligibility, DU-level nonresponse, and person-level nonresponse. The NHSDA design is a multistage design with

deep stratification, which can be viewed as a two-phase design with the second-phase units of persons nested within the first-phase DUs. After the DU selection, first-phase information (e.g., eligibility, age, race/ethnicity, and gender) for all members of the DU is collected, then age is used to define deep stratification variables for the second-phase sample of persons within eligible DUs. At this phase, 0, 1, or 2 persons are selected within each DU using an adaptation of Brewer's sampling scheme. Unlike paper-and-pencil interviewing (PAPI) used in NHSDAs prior to 1999, the 51-State sample uses a computer-assisted interviewing (CAI) methodology.

As in 1999, the sample weighting of the 2000 NHSDA posed challenges because of the sheer magnitude of the number of State-specific predictors for use in nonresponse (nr) and poststratification (ps) adjustments. With the 51-State survey, it was not practical to use a single model for each of the adjustments. Also, treating each State separately was not desirable because individual State sample sizes are not large enough to support reliable estimation of a number of parameters. It was decided to group the 51 States into nine model groups corresponding to the nine Census divisions. This helped to keep a substantial number of predictor variables in each model while reducing the computational time that would be associated with fitting a large number of models.

Like the 1999 NHSDA, an important feature of the 2000 NHSDA sample weighting was to take advantage of the inherent two-phase nature of the NHSDA design (although the design is primarily viewed as multistage) by adding a step to poststratify the household weights in the first phase of the screening interview (see Exhibit 1.1). This will reduce coverage bias resulting from the first phase of sampling and produce estimated controls for use in ps of person-pair weights and household weights in the second phase of the drug use interview. It may be noted that there is no other suitable source for obtaining these controls for ps. Note also that screener DU weights are poststratified to population counts by adjusting the DU's weighted contribution of person counts to various demographic domains. The second important feature was to add a step to poststratify selected persons (including respondents and nonrespondents) to estimated controls from the large first-phase sample of persons for various predictor variables at the segment, DU, and person levels. This will give stable controls for the step involving the nonresponse adjustment of respondent weights. It would not have been possible to incorporate this important feature in the absence of screener data information on the sociodemographics of members of the selected households.

Exhibit 1.1 Sampling Weight Calibration Steps



As in the 1999 NHSDA, to meet the new demands on weighting mentioned above, a modification of the earlier methodology of (scaled) constrained exponential modeling was used. The modified methodology, the generalized exponential model (GEM), has several features:

- It allows for different bounds on the adjusted weights for different cases (or sample units). Thus, adjustments on initially identified extreme weights can be kept under control by having a separate set of bounds for extreme weights.
- The above built-in control on the adjustments to extreme weights is useful for the low frequency of extreme weights. However, GEM can also be used for a separate extreme weight treatment after final poststratification whenever the poststratified weights exhibit a high frequency of extreme weights. In this application, tight bounds are used, such that the original sample distribution of weights for various domains is preserved.
- GEM allows for a unified approach to extreme value (ev) treatment, nr adjustment, and ps of initial design weights. The differences are only in terms of bounds and control totals for the adjusted weights.
- GEM is a generalization of the commonly used raking-ratio method in which a distance function is minimized such that the initial weights are minimally altered, lie within certain bounds, and control totals are met. It is also a generalization of Deville and Särndal's (1992) logit method in that bounds on weights are not required to be uniform. Moreover, the lower bound can be set to 1, often desirable for the nr adjustment.
- Like the raking-ratio method, GEM fitting requires iterations (such as Newton-Raphson).

The organization of this report is as follows. In Chapter 2, we review GEM and describe heuristically how it provides a unified approach to all three procedures of ev treatment, nr, and ps adjustments. In Chapter 3, we discuss potential predictor variables for use with ev, nr, and ps, and we review the strategy for dealing with many predictors via model groups. In Chapter 4, practical steps for implementation of GEM with particular reference to the NHSDA are presented. In Chapter 5, we detail the weight calibration, including various weight components corresponding to Phases I and II. We consider the evaluation measures of calibrated weights in Chapter 6. Here, we also present a sensitivity analysis of point estimates and standard errors (adjusted for calibration) of selected drug prevalence estimates by comparing the final models with the baseline models consisting of only main effects. Finally, some technical details about GEM, calculation of poststratification controls, and the demographic imputation of screener variables are given in the appendices, followed by various tables.

Chapter 2. Generalized Exponential Model for Weight Calibration

In survey practice, design weights are typically adjusted in three steps: (1) for ev's, via winsorization, (2) for nr via weighting class adjustments, and (3) for ps via raking-ratio adjustments. If weights are not treated for ev's, the resulting estimates, although unbiased, will tend to have low precision. The bias introduced by winsorization is alleviated to some extent through ps. The nr adjustment is a correction for bias introduced in estimates based only on responding units, ps is an adjustment for coverage (typically undercoverage) bias, as well as for variance reduction due to correlation between the study and control (usually demographic) variables.

There are limitations in the existing methods of weight adjustment for ev, nr, and ps. It would be desirable to adjust for bias introduced in the ev step (when extreme weights are treated via winsorization) in that the sample distribution for various demographic characteristics is preserved. For the nr step, there are general raking-type methods, such as the scaled constrained exponential model developed by Folsom and Witt (1994), where the lower and upper bounds can be suitably chosen by use of a separate scaling factor. The factor is set as the inverse of the overall response propensity. It would be desirable to have a model for the nr adjustment factor so that the desired lower and upper bounds on the factor are part of the model. Note that the lower bound on the nr-adjustment factor should be 1, as it is interpreted as the inverse of the probability of response for a particular unit. For the ps step, on the other hand, the general calibration methods of Deville and Särndal (1992), such as the logit method, allow for built-in lower (L) and upper (U) bounds (for ps, typically $L < 1 < U$). However, it would be desirable to have nonuniform bounds (L_k, U_k) depending on the unit k such that the final adjusted weights, w_k , could be controlled within certain limits. An important application of this feature would be weight adjustments in the presence of ev such that the user will have some control on the final adjustment of the initially identified ev.

A modification of the earlier method of scaled constrained exponential model of Folsom and Witt (1994), termed as the method of GEM and proposed by Folsom and Singh (2000), provides a unified approach to the three weight adjustments for ev, nr, and ps, and it has the desired features mentioned above. The functional form of the GEM adjustment factor is given in Appendix A. It generalizes the logit model of Deville and Särndal (1992), typically used for ps, such that the bounds (L, U) may depend on k . Thus, it provides a built-in control on ev during both ps and nr adjustments. In addition, the bounds are internal to the model and can be set to

chosen values (e.g., $L_k = 1$ in the nr step). If there is a low frequency of ev in the final ps, then a separate ev step may not be necessary.

In fitting GEM to a particular problem, choice of a large number of predictor variables along with tight bounds will have an impact on the resulting unequal weighting effect (UWE) and the proportion of ev. In practice, this leads to somewhat subjective considerations of trade-off between the target set of bounds for a given set of factor effects, and the target UWE and the target proportion of ev. It may also be beneficial to look at the proportion of "outwincors" (a term coined to signify the extent of residual weights after ev treatment via winsorization), which is probably more realistic in determining the robustness of estimates in the presence of ev weights. Chapter 4 provides details about GEM steps and some practical guidelines about fitting such a model.

A large increase in the number of predictor variables in GEM typically would result in a higher UWE, thus indicating a possible loss in precision. A more precise measure of loss (or gain) in precision could be obtained by looking at the Taylor linearized variance obtained via the sandwich formula (which accounts for the variability in the GEM parameter estimates) of selected study variables. This was implemented by Vaish, Gordek, and Singh (2000), and some results are presented in Chapter 6.

Chapter 3. Predictor Variables in GEM for the NHSDA

For the 2000 NHSDA, the initial set of predictor variables is identical to the one used for the 1999 NHSDA. Typical predictors used for the screener DU nr adjustment are State/region, quarter, group quarters indicator, population density, percentage Hispanic in segment, percentage black in segment, percentage owner-occupied DUs in segment, and socioeconomic status (SES) indicator. Similarly, the predictors for the person-level nr adjustments include, in addition to those stated above, age group, gender, race, Hispanicity, and relation to head of household. For ps, predictors typically used are State/region, age, race, gender, Hispanicity, and quarter; the model consists of main effects and some interactions of these predictors. For a separate ev treatment with GEM after ps, we could use the same predictors as used in the ps adjustment.

Note that, whenever possible, it is desirable to include ps predictors (correlated with the outcome variable) as part of nr predictors (correlated with the response variable) because of the potential variance reduction as an offset to the variance inflation due to random controls used in the nr adjustment. In general, this is not possible because of the unavailability of information about demographic variables (often used for ps) for nonrespondents. However, with two-phase designs such as the NHSDA, there is no such problem because the screener data contains the necessary information. There is, of course, the cost in time and effort required to edit and impute the screener-based predictors in advance of this nr adjustment. Sometimes ps and nr adjustments are, in practice, combined into a single ps step, thus eliminating the need to edit/impute nr predictors for the full sample consisting of respondents and nonrespondents. We believe, however, that the processes leading to nr and coverage errors are likely to be different enough to benefit from separate modeling. The nr adjustment models can also benefit from the segment-level variables like the percentage owner-occupied DUs. Population totals for these segment-level variables have not been developed for use as ps controls.

Because of the State-specific nature of dealing with the problem of too many controls in nr- and ps-adjustment models, we follow the strategy proposed by Singh, Penne, and Gordek (1999). Exhibit 3.1 shows the definition and levels of various predictor variables. The variable "Segment-Combined Median Rent and Housing Value" is a composite measure based on (standardized) median rent, median housing value, and the percentage of dwellings that are owner occupied. Using Singh et al. (1999), we can draw some general guidelines on choosing an initial set of State-specific controls and modify the initial set iteratively as we face problems in meeting them. We would begin with the baseline model of one-factor effects and then attempt to add higher order effects (two and three), although some collapsing might be needed depending

Exhibit 3.1 Definition of Levels for Variables

Age

1: 12-17, 2: 18-25, 3: 26-34, 4: 35-49, 5: 50+¹

Gender

1: Male, 2: Female¹

Group Quarter Indicator

1: College Dorm, 2: Other Group Quarter, 3: Non-Group Quarter¹

Hispanicity

1: Hispanic, 2: Non-Hispanic¹

Percent of Owner-Occupied Dwelling Units in Segment (% Owner)

1: 50% - 100%,¹ 2: 10% - 50%, 3: <10%

Percent of Segments That Are Black (% Black)

1: 50% - 100%, 2: 10% - 50%, 3: <10%¹

Percent of Segments That Are Hispanic (% Hispanic)

1: 50% - 100%, 2: 10% - 50%, 3: <10%¹

Population Density

1: MSA 1,000,000 or more, 2: MSA less than 1,000,000, 3: Non-MSA urban, 4: Non-MSA rural¹

Quarter

1: Quarter 1, 2: Quarter 2, 3: Quarter 3, 4: Quarter 4¹

Race (3 level)

1: White,¹ 2: Black, 3: Other

Race (4 level)

1: White,¹ 2: Black, 3: American Indian/Alaska Native, 4: Asian

Relation to Householder

1: Householder or Spouse, 2: Child, 3: Other Relative, 4: Non-Relative¹

Segment Combined Median Rent and Housing Value (Rent/Housing)²

1: First Quintile, 2: Second Quintile, 3: Third Quintile, 4: Fourth Quintile, 5: Fifth Quintile¹

States³

Model Group 1: 1: Connecticut, 2: Maine, 3: New Hampshire, 4: Rhode Island, 5: Vermont,
6: Massachusetts¹

Model Group 2: 1: New Jersey,¹ 2: New York, 3: Pennsylvania

Model Group 3: 1: Illinois, 2: Indiana,¹ 3: Michigan, 4: Wisconsin, 5: Ohio

Model Group 4: 1: Iowa, 2: Kansas, 3: Minnesota, 4: Missouri,¹ 5: Nebraska, 6: South Dakota,
7: North Dakota

Model Group 5: 1: Delaware, 2: District of Columbia, 3: Georgia,¹ 4: Maryland, 5: North
Carolina, 6: South Carolina, 7: Virginia, 8: West Virginia, 9: Florida

Model Group 6: 1: Alabama, 2: Kentucky, 3: Mississippi, 4: Tennessee¹

Model Group 7: 1: Arkansas,¹ 2: Louisiana, 3: Oklahoma, 4: Texas

Model Group 8: 1: Colorado, 2: Idaho, 3: Montana, 4: Nevada, 5: New Mexico, 6: Utah, 7: Wyoming,
8: Arizona¹

Model Group 9: 1: Alaska, 2: Hawaii, 3: Oregon, 4: Washington,¹ 5: California

¹ The reference level for this variable. This is the level against which effects of other factor levels are measured.

² Segment combined Median Rent and Housing Value is a composite measure based on rent, housing value, and percent owner occupied.

³ The States or district assigned to a particular model are based on Census divisions.

on the individual State sample sizes. In collapsing effects, every effort was made to include as many important State-specific covariates (typically defined by sociodemographic domains by State geography) as possible in models for nr and ps weight adjustments in order to obtain more precise State-level estimates. However, keeping a multitude of State-specific covariates, especially higher order interactions, was not possible because individual State sample sizes were not large enough to support stable estimation of a fair number of model parameters. Therefore, we used a hierarchical order in grouping States for covariate inclusion in the model; the order started with covariates at the national level, followed by covariates at the census division level within the Nation, then covariates at the combined-State level within the census division, and finally, whenever possible, covariates at the State level within the combined States.

In situations where adding certain covariates to the model results in parameters that cannot be estimated, or are unstable, the hierarchy strategy mentioned above was used to combine States within a Census division so that covariates at the combined level could be included. However, this problem typically arose with State-specific higher order interactions, and States were collapsed only when combining levels of covariates was not a reasonable alternative. This was thought to be beneficial in obtaining more reliable State-level estimates using SAE techniques. The eight large States were not combined with other smaller States to the extent possible in order to get direct State-level estimates without relying on the SAE technique.

Once a convergent model is obtained, measuring the gain in efficiency (for a set of study variables) is an objective check for the suitability of the number of factors. This should be checked, in addition to checking on the increase in the UWE. For the 2000 NHSDA data, as in 1999, it became apparent that the number of controls could be very high (in excess of 1,000) which would be computationally prohibitive. The implementation of GEM involves matrix inversion in each iterative step whose dimension corresponds to the number of controls. A solution is to use separate models within groups of States rather than in a single overall model. If effects (two factor or higher order) are always collapsed within a group of States, then it can be shown that fitting an overall model of GEM is equivalent to fitting separate models for each group. In this way, we can reduce the computational problem when faced with too many controls. In 2000 as in 1999, nine model groups corresponding to the nine Census divisions are used.

Chapter 4. Practical Aspects of GEM Implementation

As explained in Chapter 2, the generalized exponential model (GEM) can be used for ev treatment, nr adjustment, and ps (see Exhibit 4.1 for a schematic presentation of the steps). These steps were implemented using the GEM Macro developed at RTI.

4.1 Definition of Extreme Values of Sampling Weights

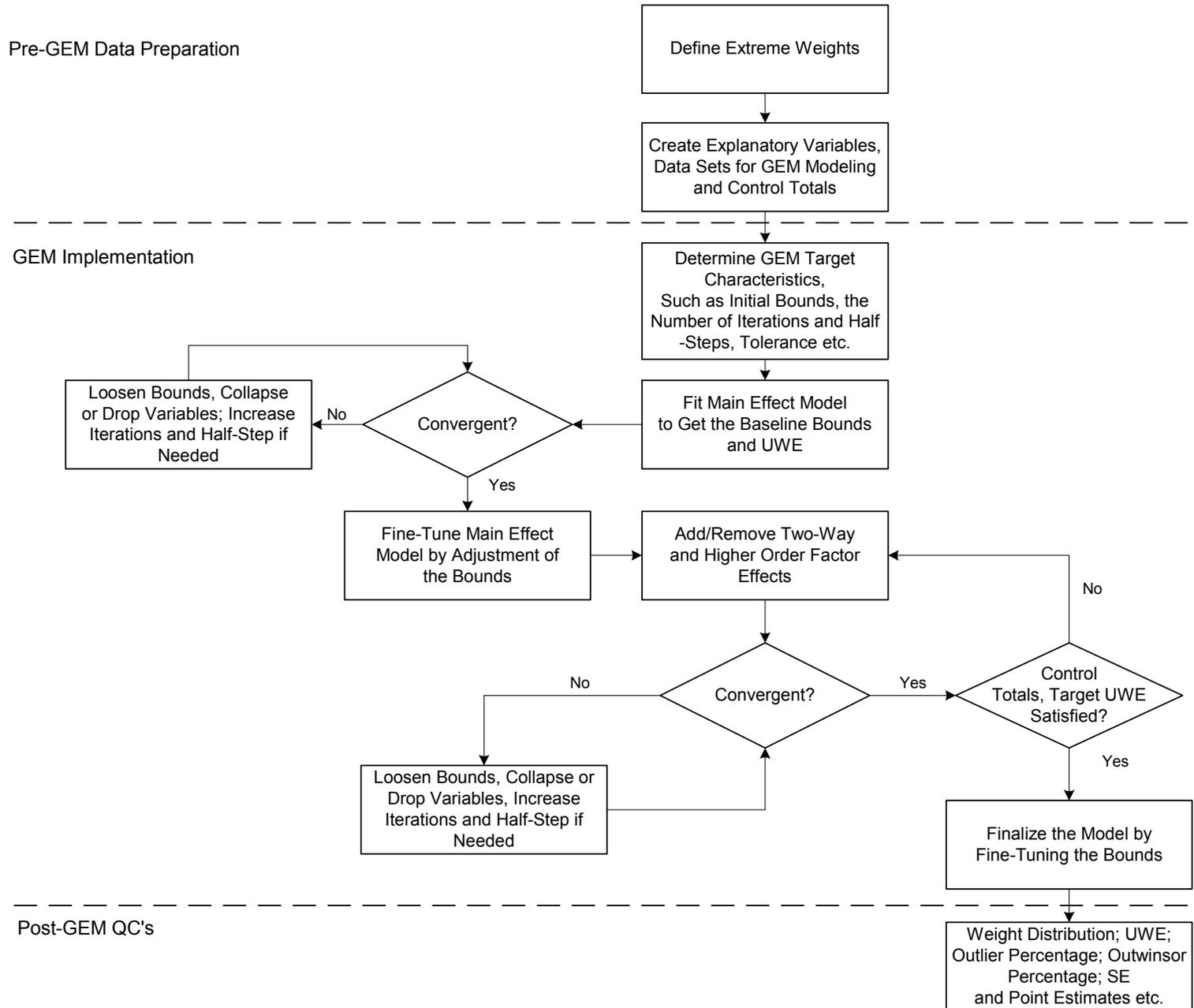
An important aspect of GEM is the built-in provision of ev treatment. For this purpose, sampling weights are classified as extreme (high or low) if they fall outside the interval, median $\pm 3 \times$ interquartile range (IQR), for some prespecified domains, defined usually by design strata taking into account deep stratification. For example, the DU level weight for the 2000 version of the NHSDA uses the FI region as the domain. Person-level weight adjustment uses the hierarchy of four domains: (1) FI region \times Age group, (2) State \times Age group, (3) FI region, and (4) State. The hierarchy is used such that a minimum of 30 observations are required for defining the extreme boundaries or critical values. If this is not met at the lower level, then the next level up in the hierarchy is used. Although the FI region \times Age group corresponds to a deep stratum, it could be unsuitable as a domain for ev definition because of insufficient sample sizes. So, collapsing FI regions within a State gives rise to such domains as State \times Age group. Even at this level, sample sizes may be insufficient, so FI regions and, later, States themselves can be used as ev definition domains. The critical values for low and high ev's are denoted by $b_{k(l)}$ and $b_{k(u)}$ hereafter. The critical points for extreme weights within GEM modeling are defined as median $\pm 2.5 \times$ the IQR, which is conservative in that weights lying on the boundary but inside are also controlled. However, for QC purposes the original definition with the factor of 3 for IQR should be used for checking the ev proportion.

4.2 Definition of Lower and Upper Bounds for Weight Adjustment Factors

For implementing extreme weight control via GEM, the variable m_k is defined as the minimum of $(b_{k(u)}/w_k)$ and 1 for high extreme weights, and the maximum of $(b_{k(l)}/w_k)$ and 1 for low extreme weights, where w_k is the sampling weight before adjustment, and $(b_{k(u)}, b_{k(l)})$ denote the threshold or the critical value for the extreme weights. Note that for the high extreme weights, the more extreme the weight is, the smaller the m_k will be. While for the low extreme weights, the smaller the weight is, the bigger the m_k will be. Non-extremes have a value of 1 for

Exhibit 4.1

Generalized Exponential Model Steps



m_k . The upper and lower bounds for the adjustment factor are defined respectively as the product of m_k and the upper and lower boundary parameters of GEM.

GEM allows inputs of three different upper and lower boundary parameters (L1 and U1, L2 and U2, L3 and U3, respectively) for high, non-, and low extreme weights. By applying a small upper boundary parameter for high extreme weights, and a large lower boundary parameter for low extreme weights, the extreme weights could be controlled in the modeling.

GEM also requires specification of centers (C) C1, C2, and C3 such that $L < C < U$. For nr adjustment, it is desirable to require all adjustments to be greater than 1 because they represent the inverse of response propensities. For convenience, all three (L1, L2, and L3) are set to 1. The value of C in this case is chosen as the inverse of the overall response propensity. For ps, Cs are set to 1 because we want to adjust the weights so that they are not too far away from the original design weight. Here, Ls are chosen to be less than 1 and Us greater than 1 because the control totals could be larger or smaller than the estimated totals based on the design weights. The case of ev treatment is analogous to the ps problem (see Appendix A). Section 4.7 gives guidelines for the choice of L, C, and U parameters.

4.3 Definition of Control Totals

GEM modeling for the ev treatment, nr adjustment, and ps involves estimation of parameters of the adjustment factor model such that certain control totals are satisfied. There are two types of control totals. For nr adjustment, the control totals are from the full sample (i.e., respondents and nonrespondents), while for ps, control totals are obtained from external sources, such as the Census Bureau or a large first-phase sample. For example, in the 2000 NHSDA, the control totals for various domains for the (selected) person-level ps adjustment were obtained from the first-phase sample containing roster information, and the control totals for the (respondent) person-level ps were obtained from the Census Bureau's postcensal population estimates for various demographic domains. Controls used for ev turned out to be the same as those for ps because they are based on the poststratified weight. See Appendix B for more information.

4.4 Efficient Computation Using Grouped Data

In view of the fact that adjustment factors remain the same for units (DUs or persons) that have common values for explanatory variables used in the model, the sample data size can be reduced by grouping units having common values of the explanatory variables. This can significantly save computation time, especially if the original sample size is large. The units with extreme weights are grouped such that, in addition to the common explanatory variables,

they also have common values of m_k . GEM with group data is implemented by treating each group as a single record with an associated weight defined as the sum of the individual weights in the group. Note, however, that for GEM with grouped data, the UWE and t -test statistics normally produced in the output would be misleading because the weights in grouped data are sums of the weights for the individual units within each group. Also the definition of variance estimation stratum (VESTR) and replicates (VEREP) required for variance calculation would not be proper. To avoid these misleading results from using the grouped data, the final model should be rerun with the full (ungrouped) data.

4.5 Steps in GEM Fitting

Exhibit 4.1 depicts the GEM steps. After specifying the GEM parameters, such as the initial U and L bounds, the number of the Newton-Ralphson iterations and half-steps, and the type of weight adjustment (ev treatment, nr adjustment, or ps), a forward selection method for modeling can be used. The model with only the main effects is first fit to obtain the realized baseline U and L bounds for extreme and non-extreme weights and to calculate a baseline UWE. Without unduly increasing the UWE and the ev proportion, as many higher order interactions as possible should be added to the model to help reduce bias. Convergence problems can be addressed by loosening Ls and Us, and collapsing or dropping variables. In GEM, t -tests and p -values for significance of various effects can be computed for a previously converged model, which is helpful in deciding about the collapsing of effects when convergence problems arise with tighter bounds.

"Collapsing" implies combining the "levels" of one variable with another variable explicitly present in the model, while "dropping" implies combining with the reference levels of the variables not explicitly present in the model. Collapsing or dropping of lower order interactions has a direct impact on the inclusion of the number of higher order interactions. When adding higher order terms, all previously selected explanatory variables are retained in the model. Possible reasons for nonconvergence include explanatory variables corresponding to domains with small sample sizes, or domains with large discrepancies between estimated totals based on the initial weights and the target control totals. The variables causing problems with convergence can be identified by the high magnitude of the estimated model parameters. Once the explanatory variables are finalized, finer adjustments of Us and Ls can optimize the model by reducing UWE and the extreme weight proportions.

4.6 Quality Control Checks

Comparisons of the weight distribution, the ratio of the maximum weight to the mean weight, and UWE across various domains before, and after, the adjustment are conducted to uncover any unusual impact of weight adjustment on the initial weights. The ev proportion after adjustment is checked to see how effective the modeling was on controlling ev. Coverage bias analysis based on the slippage rates is also conducted to check the impact of ps on various noncontrolled domains (i.e. those factors which were dropped from the model). In addition, after the final weight adjustment, point estimates for the main drug use variables, as well as their standard errors (SEs) computed using a sandwich variance formula (see Section 6.5), are compared with the corresponding estimates and SEs for the baseline (or the main effects) model to check for overfitting.

4.7 Practical Guidelines in Using GEM

1. Collapsing checks for small domains. Examine the number of observations or the sample sizes in various domains defined by levels of the factor effects. If the domain sample size is zero, then the corresponding factor is generally dropped. This would automatically collapse the corresponding factor level with reference level. However, if the corresponding control total is not zero, then this would effectively prevent the control total to be met by the reference level. This may not be desirable if the reference level involves large States because we would like to meet the large State level controls as much as possible.

If a domain sample size is small, then collapse the corresponding factor effect with another effect based on substantive considerations. If State is involved, then it would be better, in general, to collapse within States, collapsing with other adjacent States only if needed (see Section 4.8 for more detail). The necessity of collapsing should be checked at each stage of model enlargement in the forward selection of factors. If variables were collapsed at a previous stage, the corresponding factor levels should also be collapsed at succeeding stages involving higher order factor effects under the hierarchy principle.

2. Singularity checks. As in the case of collapsing checks, singularity (linear dependence of columns of values of the predictors) checks should also be performed at each stage of model enlargement because it depends on what other predictors are in the model. Note that although all variables are linearly independent of each other, it is possible that the columns of their realized values may be linearly dependent.

3. Finding the initial factor set. After the collapsing and singularity checks, the remaining factor effects at a given stage of model enlargement form the initial factor set.

4. Baseline model. Start with the model consisting of all one-factor effects from the initial factor set and find a convergent version (after some collapsing if necessary) under no bound restrictions. Optimize the model by trying to reduce the UWE and tighten the bounds. If necessary (to obtain convergence), collapse factors corresponding to large parameter estimates. As an option, p-values may be used to determine which factors to collapse.

5. Baseline plus two-factor effects. Start with the baseline model, and add all the two-factor effects from the initial factor set. Find a convergent version under no bound restrictions. Proceed as in Guideline 4 above. In our application, first add the non-State two-factor effects, then in a separate step add the State two-factor effects.

6. Baseline with two and higher order factor effects. Start with the optimized model from Guideline 5, and add the higher order factor effects. Proceed similarly to Guideline 5 to obtain an optimum version.

7. Optimizing a model with respect to the target model characteristics. These are summarized in the following points:

- For each step of model enlargement, compute the UWE for the initial weights, and as a guideline, allow tolerance in the resulting UWE increase up to 20% or the maximum allowable UWE (generally under 6), whichever is lower.
- Use the following guidelines based on empirical considerations for setting bounds. In the case of ps and separate ev adjustments, set $L1 = L2$, and $U2 = U3$, and $C1 = C2 = C3 = 1$. Start with loose bounds of (0.1, 10) and use the realized bounds (from the GEM modeling output) to make informed decisions about the degree to which the bounds may be tightened. The $U1$ and $L3$ will be tightened as close to 1 as possible ($L2, U2$) will vary inside (0.3, 4).
- In the case of nr, set $L1 = L2 = L3 = 1$, and $U2 = U3$. All the Cs are set equal to the common value of the overall inverse response propensity. Start with the loose bounds of (1, 10). The $U1$ will be tightened as close to C as possible. $U2$ will vary inside (1, 4).
- For target percentage ev's and outwinsors within GEM for nr and ps, the general guideline is to try to keep, respectively, the unweighted ev's, weighted ev's, and outwinsors under 3%, 15%, and 5%; these percentages are liberal and serve as U bounds only. In practice, it is preferable to be able to reduce them by half. If

these guidelines cannot be met, a separate GEM for the ev treatment is implemented after ps.

8. Evaluation Measures. After each stage of model enlargement, it is important to examine various characteristics for large values. These can be UWE, the ratio of the maximum to the mean weight factor, percentage ev's and outwinors, the distance between the total sample weighted count and the target population count (i.e., slippage rates by different domains) and other characteristics such as weight summary statistics, and distributions of adjustment factors for highly asymmetric tails). With the bounds realized for the final model, run the baseline model, then compare point estimates and SEs for selected outcome variables for the two models. Generally, the two estimates are likely to be close, but not the SEs. The SE for the final model is expected to be smaller but at times may be larger. Larger SEs should be identified and examined because they may be an indication of the instability of the model parameter estimates due to possible over fitting and insufficient sample sizes. In such situations, the final model should be revised to get a more parsimonious model.

4.8 Variable Collapsing Guide

As discussed in Section 4.5, the convergence problem in GEM can be solved by either loosening bounds or collapsing explanatory variables. Grouping of proposed levels into a smaller number of categories can be done in several ways, but care should be taken so that they remain meaningful. When constructing the model and attempting to obtain convergence, maintenance of logical groupings should be a top priority. Below are some general guidelines that were followed when collapsing variables.

- *Ordinal Variables.* Most of the proposed explanatory variables are ordinal. Thus, collapsing should be done in a meaningful way in the sense of the order. For example, the combined rental/house quintile has 5 levels (i.e., 1st, 2nd, 3rd, 4th and 5th quintile) with the 5th quintile set for the reference. If 4th quintile needs to be collapsed, it should be collapsed with either the 3rd or 5th quintile.
- *Age Groups.* Age group has 5 levels; 12 to 17, 18 to 25, 26 to 34, 35 to 49 and 50 or older. For the main effects, the five levels should be easily fit in the model. For the interactions, age group is given highest priority. The collapsing should be performed within age group first; collapsing across age group occurs only if the age group can not be maintained separately.
- *Large and Adjacent States.* In the main effects, fitting State separately in the model should not be a problem. For the State specific interactions, collapsing

should be done within State first, collapsing with other adjacent States only if needed. For the eight States with large sample sizes (NY, PA, FL, TX, CA, OH, IL, MI), every effort should be made to preserve all factor levels within States so that direct estimates can be made for the large States.

- *Race*. In the main effects and State-specific two-factor interactions, race has four levels (white, black, American Indian/Alaska Native, and Asian), while in non-specific two- and three-factor effects, race has three levels, (white, black and other). If it is difficult to maintain all four levels in the State, race interaction, using the collapsed three- level definition is preferable, since it preserves the existing race definition at the three-factor level. If the three-level race can not be maintained, then collapse to white and non-white.

Chapter 5. Weight Calibration at Phase I Dwelling Unit and Phase II Person Levels

The 2000 NHSDA was based on probability sampling so that valid inferences could be made from survey findings to the target population. Probability sampling refers to sampling in which every unit on the frame is given a known, nonzero probability for inclusion in the survey. This is required for unbiased estimation of the population total. The assumption of nonzero inclusion probability for every pair of units in the frame is also required for unbiased variance estimation. The basic sampling plan involved three stages of selection across two phases of design; see Exhibit 5A: (1) within Phase I, the selection of subareas or segments (comprised of U.S. Census blocks; see Exhibit 5B) within State FI regions; (2) the selection of DUs within these subareas; and (3) within Phase II, the selection of eligible individuals within DUs (Table 5.1). Specific details of the sample design and selection procedures for the first-stage sample can be found in the 2000 NHSDA sample design report (Bowman et al., 2002).

As part of the post-survey data-processing activities, analysis weights were calculated for the 2000 NHSDA respondents that reflected the selection probabilities from various stages of the sample design. These sample weights were adjusted at both the DU (screening sample) and person-level (drug questionnaire sample) to account for bias due to ev's, nr, and undercoverage (i.e., ps).

The final Phase I DU and Phase II person-level sample weights for the 2000 NHSDA sample are a product of several factors (see Exhibit 5A), each representing either a probability of selection at some particular stage or some form of ev, nr, or ps adjustment. In the following sections, we describe these components in greater detail. In summary, the first nine factors are defined for all screener-complete DUs and reflect the fully adjusted DU sample weight. The latter five components reflect the person-level selection within each screened DU, as well as any additional adjustments for person-level ev, nr, and ps error. Note that the unconditional, final person-level weights for the 2000 NHSDA sample are the product of all 14 weight components illustrated in Exhibit 5A.

Note that the order of the extreme weight treatment step (ev) at both DU and person level is different from the order used in the 1999 NHSDA (CAI). In the 1999 NHSDA (CAI), the ev step was introduced before nr and ps, which is analogous to the traditional trimming step before nr and ps. In the 1999 NHSDA, the initially identified extreme weights were held fixed at their winsorized values and the non-extreme weights were adjusted so that the original sample distribution of the weights for various domains was preserved. For the 2000 NHSDA, it was

Exhibit 5A Summary of 2000 NHSDA Sample Weight Components

Phase I Dwelling Unit Level

Design Weight Components	
#1	Inverse Probability of Selecting Segment
#2	Quarter Segment Weight Adjustment
#3	Subsegmentation Inflation Adjustment
#4	Inverse Probability of Selecting Dwelling Unit
#5	Inverse Probability of Added Dwelling Unit
#6	Dwelling Unit Percent Release Adjustment

#7	Dwelling Unit Nonresponse Adjustment (<i>res.sdu.nr</i>)*
#8	Dwelling Unit Poststratification Adjustment (<i>res.sdu.ps</i>)*
#9	Dwelling Unit Extreme Weight Adjustment (<i>res.sdu.ev</i>)*

Phase II Person Level

Design Weight Components	
#10	Inverse Probability of Selecting a Person Within a Dwelling Unit

#11	(Selected) Person-Level Poststratification to Rostered Persons Adjustment (<i>sel.per.ps</i>)*
#12	Person-Level Nonresponse Adjustment (<i>res.per.nr</i>)*
#13	Person-Level Poststratification Adjustment (<i>res.per.ps</i>)*
#14	Person-Level Extreme Weight Adjustment (<i>res.per.ev</i>)*

* These adjustments use the generalized exponential model (GEM), which also involves pre- and post-processing in addition to running the GEM macro. See Exhibit 4.1.

For computational feasibility, all weight adjustments were done using the nine model groups based on U.S. Census divisions defined in Exhibit 5B.

Exhibit 5B U.S. Census Divisions/Model Groups

Model Group	Census Division
1	New England (6 States) Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
2	Middle Atlantic (3 States) New Jersey, New York, Pennsylvania
3	East North Central (5 States) Illinois, Indiana, Michigan, Ohio, Wisconsin
4	West North Central (7 States) Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
5	South Atlantic (8 States and the District of Columbia) Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia
6	East South Central (4 States) Alabama, Kentucky, Mississippi, Tennessee
7	West South Central (4 States) Arkansas, Louisiana, Oklahoma, Texas
8	Mountain (8 States) Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming
9	Pacific (5 States) Alaska, California, Hawaii, Oregon, Washington

Table 5.1. Sample Size by Model Group for Each Stage of Sampling

Model Group	Eligible DU	Completed DU	Eligible Persons	Selected Persons	Completed Persons
1	15,416	14,070	28,801	7,472	5,608
2	24,539	22,549	46,379	11,487	8,786
3	33,844	31,270	64,054	17,376	13,094
4	14,738	13,813	27,795	8,052	6,261
5	30,608	28,740	57,995	14,202	11,331
6	9,218	8,650	17,228	4,606	3,818
7	14,845	14,099	29,117	8,409	6,892
8	15,074	14,240	29,916	9,229	7,304
9	24,294	22,320	48,388	11,128	8,670
Total	182,576	169,751	349,673	91,961	71,764

believed that a better alternative would be to let GEM control extreme weights as much as possible during nr and ps steps, and then perform a separate ev step after ps if necessary. This separate ev step would be like a repeat ps except that the extreme weights identified after ps would have tighter bounds, such that the sample distributions in various domains are preserved— this is equivalent to satisfying the ps controls. The ev step was not needed at either the DU or person levels.

5.1 Phase I Household-Level Weight Components

5.1.1 Weight Components #1 to #6: Adjustment for the Random Selection of a Dwelling Unit

The first six components in the Phase I sample weights reflect the probability of selecting the DUs. These components are derived from (1) the probability of selecting the geographic segment within each State FI region; (2) a quarter segment weight adjustment; (3) a subsegmentation inflation factor; (4) the probability of selecting a DU from within each counted and listed sampled segment; (5) the probability of inclusion of added DUs; and (6) DU percent release adjustment.

It should be noted that segments are selected with probabilities reflective of a full year's sample; therefore, Weight Component #2 is set to 1 in the 12-month analysis, and to 2 for the 6-month analysis (because only half of the segments are used in the analysis). Also, when our field staff, who are responsible for counting and listing, traveled to a specified segment, occasionally they may have found the number of potential DUs to be much greater than what our sample frame (constructed from 1990 U.S. Census data adjusted for 1995 Claritas projections) indicated. This happened either because of errors in the frame or, more commonly, because of rapid growth in a particular geographic area. When this occurred, we partitioned the original segment and randomly selected a subsegment. The Weight Component #3 (i.e., subsegmentation inflation factor) is an adjustment that accounts for this selection process.

As noted in the 2000 sample design report, a lengthy process of determining the optimal DU sample was used during the design of the survey. Weight Component #4 is a result of this process and is equal to the inverse of the DU sample size divided by the total number of DUs counted and listed.

Furthermore, the list of DUs, which includes housing units and group quarters, was constructed by the counting and listing staff during the summer and fall of 1999. Because the listing was done a short time before the 2000 screening and interviewing activities began, no major discrepancies were expected. However, factors such as new construction, demolition, and

inaccurate listing may be present in some cases. More commonly, DUs may have been "hidden" and therefore overlooked by the counter and lister. For all DUs to be given a chance of being selected, the NHSDA has a procedure for locating and adding missed DUs. The current procedure requires FIs to look both on the property of selected DUs and between that DU and the next listed DU (half-open interval rule). In 2000, the rule was modified such that the half-open interval is closed on each map page. Therefore, if the selected DU is the last on a page, the "next listed DU" will be the first one listed on the same page. If the number of added DUs linked to any particular DU does not exceed five, or if the number for the entire segment is less than or equal to ten, the FI is instructed to consider these DUs as part of his or her assignment. However, if either of these limits is exceeded, the FI will contact Research Triangle Institute (RTI) for subsampling to be considered. Weight Component #5 accounts for any subsampling that occurs due to added DUs.

In order to account for corrections and/or modifications that occur during the process of design optimization, an additional sample was included throughout Quarters 2, 3, and 4. Weight Component #6 is the adjustment for the percentage of the DU sample released to FIs in these quarters.

For more detailed information on Weight Components #1 and #3 through #6, refer to the 2000 NHSDA sample design report (Bowman et al., 2002).

5.1.2 Weight Component #7: Dwelling Unit Nonresponse Adjustment

After DUs were selected, an FI was sent to the DU to screen the residence. Failure to obtain the screening interview from eligible DUs represents the first type of nr encountered in the survey. To account for this nr, as in previous NHSDAs, we have adjusted the (unconditional) sample weights up to this point (equal to the product of Weight Components #1 to #6) using a multiplicative adjustment factor derived from modeling response propensity via GEM.

5.1.3 Weight Component #8: Dwelling Unit Poststratification Adjustment

The screener data provides a large sample with information on some demographic variables for the households; therefore, as in two phase sampling, we can first adjust screener dwelling unit (SDU) weights for ps and nr adjustments and later use estimates based on screener data for household variables as control totals for weight adjustment at the second phase and person pair-level weights. This is useful because, unlike Census controls for individual persons, we do not have controls for person pairs. Note that for person-level screener data, controls can still be used because each SDU's contribution can be computed as the number of persons in the

SDU having certain demographic characteristics times the SDU weight. It follows that although explanatory variables used for modeling SDU weight adjustment are counts (instead of binary (0/1) as is often the case), person-level census controls can still be used. For example, age group has five categories (12 to 17, 18 to 25, 26 to 34, 35 to 49, and 50 or older); in SDU ps, category 12 to 17 is the number of the persons in this age category within a DU, and so on. The intercept is the total number of persons in the DU, which varies by SDU because SDU size is not constant. One thing that should be noted is that, in defining interaction control variables with respect to count variables, do not simply multiply the corresponding count variables as is done for the binary case; use the count for the category defined by the interaction (say, age by gender) instead.

Additionally, the screening process only requires the reporting of age for each person rostered; as a result, some fields of demographic information (e.g., race, Hispanic origin, and gender) may be missing. Missing data for race and Hispanic origin were imputed using the newly developed predictive mean neighborhood (PMN) methodology (see Appendix C). The probability of observing race (white, black, American Indian/Alaska Native, Asian) was modeled using PROC MULTLOG in SUDAAN, the probability of observing Hispanic origin was modeled using PROC LOGISTIC in SAS. Those probabilities were used in computation of predictive means and delta neighborhoods. The hot deck method then was used to randomly pick a donor from the neighborhood to impute a missing value for each case. Missing data for gender were imputed using an unweighted "hot deck" methodology (see Appendix C). The data file is sorted by auxiliary variables that are considered relevant to the variable being imputed. The sort order of these auxiliary variables is chosen to reflect the degree of importance of the auxiliary variables in their relation to the variable being imputed. Exhibit 5.1.3.1 displays the order in which demographic variables were imputed along with explanatory variables used in the model or in hot deck sorting.

5.1.4 Weight Component #9: Dwelling Unit Extreme Value Adjustment

The product of Weight Components #1 through #8 was checked to see if the ev step was needed. Using the FI region as the domain for the extreme weight definition, weights were defined as extreme if they were outside the median $\pm 3 \times$ IQR. Since the unweighted, weighted, and winsorized ev proportions were not high, the ev treatment was not necessary (see results in Appendix F). Therefore, Weight Component #9 was set to 1 for every DU with a completed screener.

Exhibit 5.1.3.1 Imputed Demographic Variables and Corresponding Explanatory or Auxiliary Sort Variables

Imputed Variable	Methodology	Explanatory or Auxiliary Sort Variables
Race	Multivariate predictive mean neighborhood (MPMN)	Census region, household type (white, black, Hispanic), percent of segments that are black, percent of segment that are Hispanic, percent of owner-occupied DUs in segment, segment combined median rent and housing value, age group
Hispanic Origin	Univariate predictive mean neighborhood (UPMN)	Census region, imputed race, household type (white, black, Hispanic), percent of segments that are black, percent of segment that are Hispanic, percent of owner-occupied DUs in segment, segment combined median rent and housing value, age group
Gender	Hot Deck	Census division, , imputation-revised Hispanic origin, imputation-revised race and a random sort number

After this adjustment was completed, the final DU weight was calculated as the product of Weight Components #1 to #9 described above. This adjusted weight can be used to compute household-level estimates from the screener data. It can also be used to compute person-level estimates derived from the full roster sample. In addition, these nine weight components become the first nine components of the final interview respondent sample weight. The remaining five weight components discussed in the next section account for the person probability of selection for those persons for which a NHSDA interview was sought; they also account for person-level nr, ev treatment, and coverage errors resulting from the last stages of the sample design.

General information on the final models used for DU nr and ps adjustment for each respective model group can be found in Appendix D.

5.2 Phase II Person-Level Weight Components (CAI)

5.2.1 Weight Component #10: Adjustment for the Random Selection of a Person Within a Dwelling Unit

The rate at which persons were selected within each DU depends on the age group and was determined during the design of the 2000 study as was done for the probabilities of selecting DUs (i.e., Weight Component #4). Note that, similar to the 1999 NHSDA, all possible pairs of eligible rostered persons are given some non-zero probability of selection in order to facilitate unbiased variance estimation. With the advent of the use of the Apple Newton, selection probabilities are now adjusted to reflect the total household composition. The survey design restricts the number of interviews per DU to 2. With this restriction, a modified Brewer's

selection method is used to select either 0, 1 or 2 persons from the DU. (Three ghost units are defined for each DU to allow for the selection of no persons and to avoid division by zero in the Brewer's algorithm.) In short, if the sum of selection probabilities for all eligible DU members is greater than 2, then probabilities are ratio-adjusted to sum to 2. Sums less than 2 are unadjusted. These adjusted rates are then retained as the final selection probabilities. Weight Component #10 represents the inverse of this probability of selection.

5.2.2 Weight Component #11: (Selected) Person-Level Poststratification

This step was started with the 1999 NHSDA. In NHSDAs prior to 1999, a combined step of person-level nr , and ps to estimated totals from the screener person data was used as a compromise to this step. As we did for the 1999 NHSDA, we divided it into two separate steps of ps of the selected persons (i.e., respondents and nonrespondents) to estimated control totals from the screener person data, followed by (respondent) person-level nr adjustment (see Component #12) to reproduce control totals from the selected person (i.e., full sample) data. This takes advantage of the inherent two-phase nature of the NHSDA design, although the design is primarily viewed as multistage. With this step, more stable (compared to the traditional nr adjustment) controls for the nr adjustment are obtained because of the additional selected person ps . Note that this would not have been possible in the absence of screener data on demographics of members of the selected DUs. See Appendix D for details on the final models.

5.2.3 Weight Component #12: (Respondent) Person-Level Nonresponse Adjustment

The next step was to adjust the sample weights of the interview respondents to the weighted demographic distributions based on the full sample.

Demographic information for the drug questionnaire respondents is available from two sources—screener data and questionnaire data—while only screener data are available for the big first-phase sample of rostered individuals of all the screened DUs. However, to be consistent with respect to the source of the data, screener data for both respondents and the nonrespondents were used for the person-level nr adjustment. It may be noted that during screening, the only required demographics are the age of each person rostered. Thus, such demographics as race/ethnicity and gender of all the rostered eligible persons are not required, and imputation procedures may be needed to replace missing data for race/ethnicity and gender. For race/ethnicity, imputations were created using PMN methodology, and for gender, imputations were created using hot-deck methodology. It should be noted that answers from the questionnaire respondents could potentially cause discrepancies between screener and final

imputed-revised values of demographics. Details on the final models used for person nr adjustment for each model group can be found in Appendix D.

5.2.4 Weight Component #13: (Respondent) Person-Level Poststratification Adjustment

The final adjustment was to force weighted respondent sample data for various demographic domains to equal specified control totals obtained from the Census Bureau's estimates of the civilian, noninstitutionalized population aged 12 or older. See Appendix B for details on the derivation of control totals.

After computing the various control totals that were needed, appropriate ps factors were applied to the sample weights using our GEM in order to (1) control the resulting unequal weighting effect (thereby reducing the potential variance inflation that could result from this weight adjustment), and (2) control for a larger number of main effect and lower order interaction control totals. Details on the final models used for person-level ps adjustment for each model group can be found in Appendix D.

5.2.5 Weight Component #14: (Respondent) Person-Level Extreme Value Adjustment

The weights for the product of Weight Components #1 to #13 were checked to see if the ev step was needed, with extreme weights defined as described in Section 4.1. As in the case of Weight Component #9, unweighted, weighted, and winsorized ev proportions were acceptably low, so it was decided that ev treatment was not required at this stage either. (See results in Appendix G.) Therefore, Weight Component #14, a placeholder, was set to 1 for each responding person.

Chapter 6. Evaluation of Calibration Weights

During the weight calibration process, several criteria for quality control were implemented to assess model adequacy. In this chapter, we describe the individual procedures and a summary of their results. All tables referred to in this chapter can be found in Appendices E, F, G, H, and I.

6.1 Response Rates

Table E displays the final selected, eligible, and responding DU sample sizes and final selected and responding person sample sizes from the 2000 NHSDA, for both the national and State level. These tables also show the weighted eligibility rates and weighted response rates for DU screeners and person-level interviews. Table E, at the national level, indicates an overall eligibility rate of 84.91%, up slightly from the 1999 CAI NHSDA rate of 84.22%. The screening rate at the national level is also higher, from 89.63% to 92.84%, and the national interview response rate is 73.89%, compared to 68.63%. This increase in overall rates holds in nearly all States. Table 6.1 presents a summary of overall response rates across individual States.

Table 6.1 Summary of Overall CAI-Weighted Response Rates Across Individual States			
Domain	Minimum	Median	Maximum
<i>DU Level</i>			
Eligibility Rate	73.63% (AK)	84.70% (OK)	90.37% (CT)
Screener Response Rate	88.71% (IL)	93.59% (WA)	97.43% (NM)
<i>Person Level</i>			
Interview Response Rate	65.62% (NJ)	75.11% (ID)	84.73% (DC)

6.2 Proportion of Extreme Value and Outwisor Weights

During the stages of modeling adjustments (i.e., nr and ps), a major issue of concern when deciding the adequacy of a particular model was the extent of resulting ev weights. As explained in Section 4.1, the percentage of ev's is defined for some domains of interest using the product of weight components prior to an adjustment. Subsequently, these values are compared to the resulting ev percentage using the product of weight components that include the new adjustment.

Tables F and G present percentages of ev's at both the DU level and the person level, respectively, for the nation and individual States. Unweighted percentages are the percentage actual counts of units, defined as ev's relative to the total sample size. Weighted percentages reflect the percentage of total ev weights relative to the total sample weight, while outwinsor percentages represent the total amount of residual weight, given that the weights are trimmed to the critical values (used for ev definition), relative to the total sample weight. For evaluation purposes, the outwinsor percentage is considered the most important of the three percentages. This assessment stems from the fact that the values only reflect the actual amount of weight that would be affected by trimming.

For the 2000 NHSDA sample, domains for ev definitions are defined as follows for various weight adjustments via GEM (see Section 4.1):

- DU nr, by FI region;
- DU ps, by FI region;
- Selected person-level ps, by FI region and age, State and age, FI region, State;
- Person-level nr, by FI region and age, State and age, FI region, State; and
- Person-level ps, by FI region and age, State and age, FI region, State.

6.3 Slippage Rates

The slippage rate for a given domain is defined as the percentage difference between the design-based domain population estimate and the Census control total relative to the Census control, both before and after ps. The tables in Appendix H display national and State-level domain-specific weight sums for both before and after ps, as well as the desired totals to be met through ps. These tables also show the relative percentage difference, or the amount of adjustment necessary (positive or negative) to meet the desired totals. The first relative difference is used explicitly during the ps modeling procedure to identify potential problems for convergence. Large differences in domains with relatively small sample sizes are indicative of potentially large adjustment factors, which may cause problems in convergence while satisfying bound constraints. The reason is that adjustments required for one domain may have an adverse effect for another domain when a unit belongs to both domains. For instance, Table H19 for Kentucky indicates a sample size of 13 for Hispanics with a total design-based weight of 7,473 and the Census total of 21,667, with an initial slippage rate of -65.51%, which would imply an overall weight adjustment of 2.90. Following this example, but in the opposite direction, is Table H8 for Connecticut. The race domain for "other" contains a sample size of 55 and an initial slippage rate of 79.56%, which would necessitate an overall adjustment of 0.5569.

6.4 Weight Adjustment Summary Statistics (DU and Person)

Table I displays summary statistics on the product of weight components for before and after all stages of adjustment, DU- and person-level. Note that in situations of DU ps and selected person to eligible person ps, the before statistics are the same as the after statistics of the adjustment prior to ps and, thus, are displayed only as after statistics. Note also that there may be changes, although minimal, in person-level specific demographic distributions from screener data to questionnaire data, so the respondent sample UWE prior to ps based on the questionnaire data would only be slightly different from what would be obtained after the nr adjustment. Because UWE is directly affected by weight adjustment factors and ev's, these values along with percentage of ev's, as noted in Section 6.2, were used as guidelines for determining model adequacy.

6.5 Sensitivity Analysis of Drug Use Estimates to Baseline Models

In general, there is a trade-off between bias reduction and variance reduction. For instance, with GEM (for nr or ps), enlarging a simple model (such as the one with only main effects) has the potential of further reducing the bias. At the same time, this enlargement may be associated with a corresponding increase in the variance of the estimate due to additional variability caused by estimating the model parameters. To check for possible overfitting of the GEM model, we conducted a sensitivity analysis for the ps step where a simple baseline model was fitted with the same bounds and maximum number of iterations as that used for the chosen (more complex) final model. Then we looked for substantial changes in point estimates and SEs. If the SE increases only slightly under the complex model, or even better, if it decreases (this is possible because of the correlation between the study and predictor variables), then we would feel comfortable fitting the more complex model.

To account properly for the additional variability due to GEM parameter estimation, the standard SE (a ratio-adjusted estimator denoted by SE1) computed under SUDAAN needed modifications. A sandwich formula for the Taylor linearization (see Vaish, et al., 2000) was used to find a modified SE (denoted by SE2). We calculated these SEs as well as point estimates for a few important drug recency variables (past year marijuana, alcohol, and cigarette use) across four age groups (12 to 17, 18 to 25, 26 to 34, and 35 or older), for the eight States with large sample sizes.

As shown in Tables 6.5.1 to 6.5.6, the point estimates for the two models (baseline and final) are generally similar to each other; this is also true for the SE (both SE1 and SE2). Therefore, there is no evidence of instability in estimates obtained by fitting a large number of parameters in GEM. Note that if SE2 were found to be substantially smaller than SE1, it would

indicate that with the ps step we have the desirable situation in which we are able to realize both variance reduction (due to correlation between study and predictor variables) and bias reduction (due to meeting controls corresponding to a number of factor effects).

Table 6.5.1 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Lifetime Licit Drug Estimates, Cigarettes and Alcohol: 2000 NHSDA

Variables		US		CA		FL		IL		MI	
		Baseline	Final								
Cigarettes Lifetime											
Total	Point Estimates	66.55	66.46	61.96	61.84	66.07	65.83	66.50	66.55	68.45	68.26
	SE1	0.34	0.34	1.19	1.18	1.31	1.40	1.29	1.31	1.24	1.24
	SE2	0.34	0.38	1.08	1.21	1.27	1.18	1.28	1.28	1.24	1.20
12-17	Point Estimates	34.62	34.61	28.03	28.15	33.32	33.00	32.88	32.78	37.24	37.24
	SE1	0.40	0.41	1.34	1.31	1.51	1.48	1.49	1.46	1.37	1.36
	SE2	0.42	0.42	1.36	1.25	1.79	1.66	1.55	1.43	1.37	1.32
18-25	Point Estimates	67.24	67.32	59.32	59.46	61.81	60.99	73.49	73.17	69.93	69.55
	SE1	0.47	0.47	1.89	1.96	1.79	1.87	1.23	1.29	1.42	1.46
	SE2	0.72	1.21	1.91	1.83	1.80	1.72	1.23	1.31	1.43	1.37
26-34	Point Estimates	69.28	69.41	63.66	63.19	65.62	65.11	70.73	71.01	76.17	75.44
	SE1	0.60	0.61	1.94	1.95	2.42	2.56	1.93	1.93	1.84	1.87
	SE2	0.62	0.67	1.90	1.59	2.36	2.30	1.89	1.85	1.86	1.74
35+	Point Estimates	71.17	70.97	68.50	68.36	71.36	71.27	69.59	69.63	71.59	71.55
	SE1	0.50	0.51	1.92	1.93	1.69	1.78	1.98	1.98	1.81	1.81
	SE2	0.48	0.54	1.81	2.01	1.64	1.55	1.96	1.91	1.81	1.77
Alcohol Lifetime											
Total	Point Estimates	81.05	80.96	79.34	79.27	81.97	81.68	82.16	82.26	83.26	83.26
	SE1	0.27	0.28	1.04	1.05	1.15	1.22	0.84	0.85	0.79	0.80
	SE2	0.25	0.38	0.93	1.12	1.11	1.03	0.82	0.80	0.80	0.89
12-17	Point Estimates	41.73	41.68	38.28	38.24	43.43	43.26	41.11	40.94	42.56	42.49
	SE1	0.41	0.41	1.20	1.16	1.59	1.61	1.44	1.40	1.50	1.48
	SE2	0.42	0.43	1.23	1.11	2.14	2.03	1.48	1.43	1.50	1.48
18-25	Point Estimates	83.82	84.01	80.49	80.91	80.64	80.18	85.64	85.54	89.15	89.13
	SE1	0.38	0.38	1.34	1.31	1.84	1.89	1.21	1.24	0.97	0.99
	SE2	0.55	0.97	1.33	1.21	1.84	1.64	1.21	1.20	0.98	0.99
26-34	Point Estimates	89.17	89.10	86.47	86.37	89.02	88.63	90.08	90.30	91.46	91.03
	SE1	0.42	0.44	1.67	1.64	1.91	2.03	1.14	1.17	0.99	1.04
	SE2	0.44	1.57	1.66	1.58	1.90	1.85	1.13	1.17	0.98	0.94
35+	Point Estimates	85.18	85.03	84.85	84.63	86.18	85.91	86.34	86.44	86.97	87.10
	SE1	0.39	0.40	1.49	1.51	1.46	1.57	1.36	1.39	1.31	1.33
	SE2	0.37	0.47	1.46	1.82	1.44	1.39	1.32	1.27	1.30	1.39

(continued)

Table 6.5.1 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Lifetime Licit Drug Estimates, Cigarettes and Alcohol: 2000 NHSDA (continued)

Variables	NY		OH		PA		TX		
	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	
Cigarettes Lifetime									
Total	Point Estimates	62.88	62.46	71.46	71.53	69.16	68.97	65.03	65.20
	SE1	1.54	1.52	1.28	1.29	1.11	1.12	1.33	1.32
	SE2	1.64	1.49	1.28	1.20	1.30	1.10	1.32	1.34
12-17	Point Estimates	31.75	31.62	35.36	35.42	35.22	35.20	33.00	32.98
	SE1	1.52	1.51	1.61	1.62	1.27	1.26	1.44	1.43
	SE2	1.63	2.54	1.62	1.63	1.40	1.49	1.47	1.37
18-25	Point Estimates	62.20	63.03	73.36	73.25	73.19	73.02	66.16	65.78
	SE1	2.04	1.96	1.37	1.38	1.67	1.67	1.51	1.51
	SE2	3.89	4.53	1.36	1.22	1.71	1.72	3.20	2.01
26-34	Point Estimates	62.05	63.62	74.31	74.52	75.79	75.72	66.17	66.21
	SE1	2.12	2.20	1.50	1.53	2.06	2.08	2.06	2.06
	SE2	2.14	2.22	1.51	1.47	2.07	2.19	2.10	1.99
35+	Point Estimates	68.14	67.00	76.39	76.41	72.15	71.88	70.83	71.24
	SE1	2.33	2.33	1.91	1.91	1.66	1.67	2.00	1.98
	SE2	2.31	2.30	1.91	1.84	1.96	1.63	1.87	1.99
Alcohol Lifetime									
Total	Point Estimates	81.44	81.41	85.29	85.35	83.53	83.25	77.39	77.41
	SE1	1.04	1.00	0.86	0.86	0.88	0.90	1.14	1.13
	SE2	0.98	0.94	0.86	0.84	0.84	0.84	1.17	1.26
12-17	Point Estimates	42.05	41.82	42.16	42.15	43.09	43.04	41.99	42.03
	SE1	1.57	1.63	1.54	1.55	1.48	1.53	1.69	1.68
	SE2	1.58	2.73	1.54	1.60	1.59	1.71	1.70	1.62
18-25	Point Estimates	84.31	85.29	86.83	86.79	88.81	88.65	83.30	83.12
	SE1	1.49	1.44	1.20	1.21	1.18	1.21	1.27	1.34
	SE2	1.91	1.87	1.20	1.11	1.19	1.17	1.87	1.46
26-34	Point Estimates	87.86	89.35	92.76	92.78	93.34	92.98	86.05	86.26
	SE1	1.87	1.60	0.91	0.93	1.16	1.20	1.58	1.55
	SE2	1.90	1.65	0.90	0.95	1.18	1.29	1.64	1.50
35+	Point Estimates	85.57	85.04	90.40	90.42	86.58	86.24	80.66	80.75
	SE1	1.40	1.45	1.21	1.21	1.23	1.29	1.73	1.73
	SE2	1.31	1.30	1.21	1.22	1.21	1.21	1.72	1.95

Table 6.5.2 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Lifetime Illicit Drug Estimates, Marijuana and Cocaine: 2000 NHSDA

Variables		US		CA		FL		IL		MI	
		Baseline	Final								
Marijuana Lifetime											
Total	Point Estimates	34.19	34.17	37.63	37.56	33.36	33.39	35.49	35.34	37.86	37.76
	SE1	0.34	0.34	1.33	1.34	1.47	1.49	1.59	1.60	1.45	1.45
	SE2	0.32	0.45	1.28	1.61	1.33	1.12	1.52	1.19	1.39	1.14
12-17	Point Estimates	18.31	18.33	18.25	18.39	18.83	18.90	17.98	17.90	19.96	19.97
	SE1	0.30	0.31	0.98	0.98	1.26	1.24	1.30	1.31	1.15	1.14
	SE2	0.33	0.33	1.04	1.00	2.16	1.69	1.33	1.30	1.15	1.13
18-25	Point Estimates	45.53	45.72	44.19	44.79	43.38	42.79	49.44	49.19	52.30	52.34
	SE1	0.51	0.52	2.27	2.29	1.66	1.72	1.82	1.82	1.65	1.65
	SE2	0.63	0.72	2.26	2.13	1.67	1.59	1.83	1.86	1.65	1.62
26-34	Point Estimates	45.87	45.89	44.20	44.18	41.72	41.13	45.51	45.64	55.74	55.41
	SE1	0.66	0.67	2.72	2.76	2.83	2.87	2.22	2.31	2.09	2.13
	SE2	0.72	2.09	2.66	2.38	2.75	2.30	2.26	2.30	2.10	2.06
35+	Point Estimates	31.70	31.63	37.94	37.65	32.18	32.43	32.90	32.68	33.53	33.44
	SE1	0.49	0.49	1.92	1.93	1.92	1.93	2.29	2.29	1.99	1.97
	SE2	0.45	0.50	1.86	2.31	1.74	1.44	2.17	1.66	1.90	1.52
Cocaine Lifetime											
Total	Point Estimates	11.19	11.15	16.61	16.36	11.12	11.07	11.45	11.44	10.04	9.95
	SE1	0.23	0.23	0.98	0.98	1.06	1.05	0.96	0.95	0.73	0.74
	SE2	0.22	0.22	0.94	0.87	1.02	0.91	0.94	0.80	0.72	0.64
12-17	Point Estimates	2.36	2.35	3.10	2.99	1.93	1.95	1.41	1.32	1.72	1.76
	SE1	0.13	0.13	0.47	0.43	0.44	0.45	0.25	0.23	0.33	0.34
	SE2	0.14	0.13	0.47	0.43	0.46	0.45	0.25	0.23	0.33	0.33
18-25	Point Estimates	10.83	10.86	11.84	11.74	11.37	11.18	9.41	9.44	9.63	9.34
	SE1	0.28	0.28	1.11	1.12	0.97	0.96	1.21	1.25	0.98	0.95
	SE2	0.34	0.47	1.16	1.05	0.98	0.92	1.22	1.23	0.99	0.94
26-34	Point Estimates	15.11	15.09	18.22	18.35	16.96	16.79	13.21	13.48	15.44	15.48
	SE1	0.43	0.44	1.84	1.92	1.69	1.69	1.48	1.52	1.71	1.72
	SE2	0.47	0.61	2.03	2.01	1.65	1.56	1.49	1.56	1.71	1.62
35+	Point Estimates	11.82	11.75	19.82	19.40	11.25	11.24	13.16	13.06	10.24	10.14
	SE1	0.34	0.34	1.59	1.58	1.51	1.50	1.39	1.38	1.05	1.05
	SE2	0.32	0.32	1.57	1.37	1.45	1.28	1.36	1.13	1.03	0.92

(continued)

Table 6.5.2 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors Baseline and Final models—Drug Estimates (U.S. and Eight Large States): Lifetime Illicit Drug Estimates, Marijuana and Cocaine: 2000 NHSDA (continued)

Variables	NY		OH		PA		TX		
	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	
Marijuana Lifetime									
Total	Point Estimates	31.56	31.74	34.30	34.28	31.86	31.77	29.74	29.90
	SE1	1.23	1.27	1.33	1.34	1.21	1.19	1.53	1.55
	SE2	1.16	1.18	1.32	1.21	1.24	1.09	1.57	1.54
12-17	Point Estimates	16.90	16.90	16.66	16.74	16.74	16.79	15.80	15.86
	SE1	1.16	1.17	1.12	1.12	1.16	1.15	1.13	1.14
	SE2	1.17	2.11	1.12	1.20	1.20	1.31	1.12	1.14
18-25	Point Estimates	44.38	44.66	48.78	48.76	47.14	47.28	38.35	38.28
	SE1	1.90	1.91	1.95	1.97	1.80	1.78	1.45	1.47
	SE2	2.82	5.08	1.95	1.84	1.81	1.71	3.21	1.68
26-34	Point Estimates	42.72	44.57	48.08	48.24	47.53	47.31	33.48	33.74
	SE1	2.56	2.65	2.38	2.43	2.41	2.39	2.33	2.30
	SE2	2.50	2.78	2.38	2.33	2.53	2.67	2.33	2.23
35+	Point Estimates	28.69	28.47	30.99	30.88	27.96	27.85	29.35	29.60
	SE1	1.79	1.85	1.88	1.89	1.73	1.71	2.26	2.29
	SE2	1.68	1.58	1.86	1.70	1.76	1.62	2.29	2.37
Cocaine Lifetime									
Total	Point Estimates	9.43	9.46	8.67	8.76	9.14	9.12	8.30	8.35
	SE1	0.78	0.79	0.71	0.71	0.80	0.81	0.86	0.88
	SE2	0.77	1.00	0.70	0.65	0.85	0.83	0.86	0.89
12-17	Point Estimates	1.37	1.35	1.31	1.30	1.43	1.42	2.90	2.97
	SE1	0.43	0.43	0.33	0.33	0.36	0.36	0.49	0.51
	SE2	0.43	0.44	0.33	0.33	0.36	0.36	0.50	0.49
18-25	Point Estimates	9.17	9.35	10.12	10.00	10.34	10.33	11.28	11.17
	SE1	1.06	1.11	0.91	0.90	1.05	1.06	1.09	1.08
	SE2	1.08	5.89	0.90	0.87	1.05	1.02	1.46	1.11
26-34	Point Estimates	12.66	13.00	12.21	12.29	14.15	14.17	9.63	9.82
	SE1	1.59	1.61	1.54	1.56	1.51	1.49	1.34	1.36
	SE2	1.62	1.63	1.54	1.57	3.03	4.50	1.34	1.37
35+	Point Estimates	9.98	9.92	8.77	8.90	9.00	8.97	8.27	8.33
	SE1	1.13	1.14	1.11	1.09	1.15	1.16	1.26	1.29
	SE2	1.10	1.05	1.08	0.95	1.11	1.08	1.24	1.30

Table 6.5.3 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Year Licit Drug Estimates, Cigarettes and Alcohol: 2000 NHSDA

Variables		US		CA		FL		IL		MI	
		Baseline	Final								
Cigarettes Past Year											
Total	Point Estimates	29.11	29.13	27.07	27.20	29.32	29.21	31.72	31.49	28.98	28.74
	SE1	0.34	0.34	1.47	1.47	1.23	1.24	1.38	1.40	1.09	1.11
	SE2	0.35	0.38	1.48	1.73	1.25	1.18	1.34	1.20	1.07	0.95
12-17	Point Estimates	20.83	20.84	14.82	14.89	17.12	17.09	20.76	20.71	21.47	21.57
	SE1	0.33	0.34	0.84	0.85	1.41	1.40	1.40	1.39	1.29	1.31
	SE2	0.35	0.37	0.85	0.83	1.98	1.98	1.43	1.41	1.28	1.20
18-25	Point Estimates	45.65	45.82	35.47	35.73	41.43	40.53	51.78	51.65	50.73	50.27
	SE1	0.48	0.48	2.01	2.09	1.62	1.60	1.36	1.39	1.78	1.82
	SE2	0.59	1.03	2.05	1.95	1.61	1.57	1.37	1.32	1.78	1.72
26-34	Point Estimates	35.05	35.03	29.97	29.80	37.67	37.25	38.53	38.73	40.37	40.14
	SE1	0.57	0.58	2.00	1.98	2.64	2.62	1.94	1.95	1.98	1.98
	SE2	0.70	0.84	1.97	1.81	2.71	2.66	1.93	1.95	2.01	2.00
35+	Point Estimates	25.61	25.61	26.61	26.82	27.49	27.55	27.49	27.09	22.88	22.65
	SE1	0.51	0.51	2.33	2.32	1.77	1.79	2.00	2.00	1.58	1.58
	SE2	0.51	0.55	2.30	2.79	1.75	1.71	1.97	1.81	1.56	1.48
Alcohol Past Year											
Total	Point Estimates	61.92	61.88	61.52	61.43	61.81	61.62	64.40	64.52	63.78	63.71
	SE1	0.39	0.39	1.75	1.78	1.72	1.74	1.39	1.40	1.42	1.46
	SE2	0.37	0.50	1.59	1.43	1.66	1.51	1.36	1.27	1.39	1.29
12-17	Point Estimates	33.10	33.04	29.58	29.63	33.95	33.52	33.80	33.49	33.73	33.68
	SE1	0.38	0.39	1.11	1.10	1.74	1.73	1.31	1.28	1.42	1.41
	SE2	0.40	0.41	1.15	1.08	2.27	2.38	1.33	1.25	1.42	1.34
18-25	Point Estimates	74.27	74.44	68.66	69.19	73.67	72.99	76.34	76.04	82.11	82.05
	SE1	0.45	0.45	1.61	1.58	2.25	2.29	1.34	1.36	1.34	1.36
	SE2	0.73	1.70	1.58	1.52	2.23	2.00	1.33	1.21	1.34	1.35
26-34	Point Estimates	74.98	75.06	73.77	73.37	75.76	75.26	76.45	76.97	79.00	78.55
	SE1	0.57	0.58	2.03	2.02	2.25	2.35	1.57	1.50	1.81	1.78
	SE2	0.70	1.90	2.01	1.77	2.24	2.10	1.57	1.43	1.80	1.65
35+	Point Estimates	61.08	60.97	62.51	62.30	61.13	61.10	63.94	64.10	61.33	61.37
	SE1	0.58	0.59	2.65	2.71	2.26	2.30	2.11	2.09	2.23	2.30
	SE2	0.56	0.56	2.56	2.15	2.20	2.06	2.06	1.94	2.20	2.10

(continued)

Table 6.5.3 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Year Licit Drug Estimates, Cigarettes and Alcohol: 2000 NHSDA (continued)

Variables	NY		OH		PA		TX		
	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	
Cigarettes Past Year									
Total	Point Estimates	26.93	26.97	32.25	32.31	28.53	28.47	27.10	27.10
	SE1	0.99	1.02	1.13	1.12	1.26	1.28	1.41	1.43
	SE2	1.03	0.99	1.12	1.06	1.27	1.10	1.49	1.51
12-17	Point Estimates	20.31	20.24	20.86	20.87	21.91	21.88	21.26	21.40
	SE1	1.27	1.28	1.05	1.09	1.21	1.19	1.35	1.35
	SE2	1.30	2.43	1.05	1.09	1.25	1.22	1.38	1.39
18-25	Point Estimates	42.41	43.15	52.87	52.73	50.19	50.12	41.11	40.83
	SE1	1.80	1.74	1.70	1.73	1.73	1.73	1.44	1.44
	SE2	2.61	4.71	1.68	1.54	1.79	1.79	3.60	1.98
26-34	Point Estimates	31.18	31.33	40.52	40.57	39.62	39.40	31.45	31.24
	SE1	1.81	1.80	1.74	1.78	2.21	2.14	1.82	1.87
	SE2	1.82	2.04	1.74	1.75	3.80	5.48	1.85	1.90
35+	Point Estimates	23.91	23.80	27.88	27.99	23.17	23.17	23.58	23.69
	SE1	1.38	1.40	1.77	1.77	1.87	1.87	2.18	2.20
	SE2	1.34	1.29	1.77	1.72	1.85	1.78	2.22	2.39
Alcohol Past Year									
Total	Point Estimates	66.83	66.92	64.62	64.62	65.94	65.59	56.76	56.76
	SE1	1.40	1.39	1.43	1.43	1.33	1.32	1.31	1.32
	SE2	1.42	1.40	1.42	1.36	1.31	1.30	1.38	1.28
12-17	Point Estimates	35.31	34.95	34.51	34.54	33.83	33.77	32.86	32.93
	SE1	1.33	1.40	1.42	1.43	1.42	1.44	1.84	1.81
	SE2	1.34	2.46	1.42	1.47	1.50	1.51	1.85	1.73
18-25	Point Estimates	75.37	76.21	79.53	79.42	81.36	81.25	72.20	71.97
	SE1	1.65	1.69	1.50	1.50	1.36	1.39	1.72	1.74
	SE2	2.97	2.44	1.50	1.32	1.40	1.35	6.18	2.96
26-34	Point Estimates	74.70	76.40	78.34	78.38	80.66	80.41	70.89	70.86
	SE1	1.88	1.74	1.92	1.94	1.71	1.78	2.45	2.47
	SE2	1.94	2.06	1.92	1.78	1.73	1.77	2.43	2.23
35+	Point Estimates	68.26	67.91	63.30	63.26	64.80	64.35	53.89	54.01
	SE1	2.10	2.13	2.16	2.16	1.97	1.97	2.13	2.14
	SE2	2.05	2.02	2.15	2.08	1.97	1.92	1.98	2.07

Table 6.5.4 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Year Illicit Drug Estimates, Marijuana and Cocaine: 2000 NHSDA

Variables	US		CA		FL		IL		MI		
	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	
Marijuana Past Year											
Total	Point Estimates	8.33	8.32	10.22	10.22	8.37	8.29	8.28	8.26	10.18	10.18
	SE1	0.18	0.18	0.82	0.81	0.86	0.85	0.60	0.60	0.70	0.70
	SE2	0.17	0.17	0.89	0.76	0.83	0.75	0.59	0.51	0.69	0.57
12-17	Point Estimates	13.42	13.43	13.33	13.41	13.36	13.42	13.81	13.70	14.76	14.79
	SE1	0.26	0.27	0.88	0.86	1.27	1.27	1.07	1.09	1.02	1.02
	SE2	0.28	0.29	0.93	0.85	1.34	1.24	1.10	1.08	1.01	1.01
18-25	Point Estimates	23.56	23.66	23.59	24.02	23.37	23.02	23.55	23.32	29.53	29.58
	SE1	0.43	0.43	1.83	1.85	1.54	1.58	1.87	1.86	1.52	1.51
	SE2	0.47	0.60	1.81	1.70	1.54	1.53	1.88	1.81	1.52	1.49
26-34	Point Estimates	10.25	10.26	12.66	13.10	10.74	10.76	9.79	9.94	14.22	14.32
	SE1	0.41	0.41	1.63	1.70	1.25	1.27	1.30	1.34	1.49	1.51
	SE2	0.44	0.54	1.71	1.71	1.22	1.19	1.30	1.33	1.48	1.43
35+	Point Estimates	3.80	3.77	5.84	5.62	4.82	4.76	3.64	3.65	4.30	4.29
	SE1	0.23	0.22	1.07	1.04	1.01	1.00	0.68	0.67	0.80	0.79
	SE2	0.22	0.22	1.07	1.00	0.99	0.93	0.67	0.59	0.79	0.75
Cocaine Past Year											
Total	Point Estimates	1.48	1.49	1.79	1.79	1.58	1.55	1.58	1.54	1.26	1.24
	SE1	0.07	0.07	0.33	0.34	0.30	0.30	0.30	0.28	0.20	0.20
	SE2	0.07	0.07	0.34	0.35	0.30	0.28	0.30	0.27	0.20	0.19
12-17	Point Estimates	1.66	1.66	2.09	2.08	1.26	1.28	1.05	0.96	0.99	1.04
	SE1	0.12	0.12	0.31	0.31	0.36	0.38	0.22	0.20	0.28	0.29
	SE2	0.12	0.12	0.31	0.31	0.37	0.37	0.22	0.20	0.28	0.28
18-25	Point Estimates	4.41	4.39	4.15	4.10	5.20	5.10	3.60	3.58	4.81	4.66
	SE1	0.18	0.18	0.67	0.69	0.71	0.70	0.69	0.69	0.70	0.69
	SE2	0.20	0.18	0.69	0.71	0.72	0.67	0.69	0.69	0.71	0.67
26-34	Point Estimates	2.00	2.05	1.30	1.30	2.28	2.24	2.48	2.60	1.90	1.84
	SE1	0.16	0.18	0.29	0.31	0.79	0.77	0.58	0.60	0.70	0.68
	SE2	0.17	0.17	0.28	0.31	0.80	0.78	0.58	0.60	0.70	0.66
35+	Point Estimates	0.71	0.72	1.32	1.34	0.90	0.90	1.00	0.93	0.40	0.41
	SE1	0.09	0.09	0.53	0.53	0.38	0.38	0.49	0.45	0.24	0.24
	SE2	0.09	0.09	0.53	0.56	0.38	0.37	0.49	0.43	0.24	0.24

(continued)

Table 6.5.4 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Year Illicit Drug Estimates, Marijuana and Cocaine: 2000 NHSDA (continued)

Variables		NY		OH		PA		TX	
		Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final
Marijuana Past Year									
Total	Point Estimates	7.66	7.71	7.43	7.39	7.22	7.36	5.39	5.37
	SE1	0.60	0.60	0.53	0.54	0.70	0.71	0.44	0.45
	SE2	0.58	0.79	0.54	0.54	0.85	0.97	0.42	0.39
12-17	Point Estimates	12.65	12.60	12.78	12.84	11.89	11.97	11.32	11.34
	SE1	0.95	0.94	0.99	0.99	0.98	0.99	0.90	0.94
	SE2	0.96	1.98	0.99	1.14	1.01	1.06	0.90	0.95
18-25	Point Estimates	26.70	26.68	23.54	23.59	26.40	26.51	16.77	16.62
	SE1	1.70	1.76	1.82	1.83	1.93	1.93	1.24	1.23
	SE2	2.03	5.17	1.82	1.78	1.96	1.93	1.72	1.21
26-34	Point Estimates	10.42	10.33	8.48	8.49	7.39	7.65	5.55	5.54
	SE1	1.56	1.54	1.21	1.21	1.46	1.49	1.08	1.07
	SE2	1.56	1.54	1.21	1.19	3.55	4.86	1.10	1.06
35+	Point Estimates	2.45	2.55	2.90	2.85	2.98	3.13	1.28	1.29
	SE1	0.61	0.64	0.65	0.64	0.74	0.76	0.38	0.38
	SE2	0.61	0.61	0.65	0.62	0.73	0.71	0.37	0.38
Cocaine Past Year									
Total	Point Estimates	1.32	1.33	1.26	1.24	1.43	1.49	1.35	1.35
	SE1	0.23	0.24	0.23	0.23	0.29	0.32	0.14	0.14
	SE2	0.23	0.23	0.23	0.22	0.29	0.29	0.14	0.13
12-17	Point Estimates	1.13	1.14	0.90	0.89	1.00	0.98	2.12	2.19
	SE1	0.41	0.41	0.27	0.27	0.30	0.30	0.43	0.45
	SE2	0.41	0.41	0.27	0.27	0.30	0.29	0.44	0.43
18-25	Point Estimates	3.44	3.45	3.87	3.81	4.76	4.75	5.43	5.26
	SE1	0.51	0.55	0.54	0.54	0.81	0.80	0.74	0.71
	SE2	0.55	0.55	0.54	0.53	0.80	0.78	0.84	0.71
26-34	Point Estimates	2.44	2.36	2.19	2.20	1.14	1.14	1.53	1.66
	SE1	0.79	0.79	0.73	0.74	0.41	0.41	0.52	0.57
	SE2	0.79	0.80	0.73	0.73	0.41	0.41	0.53	0.57
35+	Point Estimates	0.66	0.70	0.55	0.53	0.96	1.04	0.12	0.12
	SE1	0.25	0.27	0.33	0.32	0.37	0.41	0.10	0.10
	SE2	0.25	0.27	0.33	0.30	0.37	0.39	0.10	0.10

Table 6.5.5 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Month Licit Drug Estimates, Cigarettes and Alcohol: 2000 NHSDA

Variables		US		CA		FL		IL		MI	
		Baseline	Final								
Cigarettes Past Month											
Total	Point Estimates	24.90	24.95	22.89	23.03	24.64	24.62	27.05	26.93	25.36	25.19
	SE1	0.31	0.32	1.27	1.27	1.23	1.23	1.35	1.36	1.04	1.09
	SE2	0.33	0.36	1.29	1.60	1.25	1.18	1.32	1.18	1.03	1.00
12-17	Point Estimates	13.47	13.44	8.54	8.63	11.42	11.37	13.57	13.52	15.40	15.45
	SE1	0.28	0.28	0.68	0.69	1.28	1.27	1.12	1.13	1.06	1.05
	SE2	0.29	0.31	0.67	0.66	1.79	1.95	1.15	1.14	1.05	1.02
18-25	Point Estimates	38.07	38.27	28.33	28.65	34.40	33.71	45.66	45.51	42.85	42.51
	SE1	0.47	0.48	1.80	1.84	1.64	1.60	1.42	1.45	1.95	1.92
	SE2	0.54	0.92	1.86	1.76	1.62	1.54	1.43	1.36	1.95	1.86
26-34	Point Estimates	29.68	29.71	24.04	23.74	31.28	31.05	31.93	32.14	34.87	34.66
	SE1	0.53	0.55	1.69	1.69	2.50	2.50	1.77	1.80	1.92	1.95
	SE2	0.68	0.85	1.73	1.66	2.58	2.52	1.75	1.83	1.95	2.00
35+	Point Estimates	22.92	22.96	24.01	24.24	23.64	23.77	24.04	23.83	21.04	20.91
	SE1	0.47	0.47	2.09	2.11	1.67	1.67	1.94	1.93	1.57	1.60
	SE2	0.47	0.52	2.10	2.64	1.65	1.61	1.91	1.77	1.56	1.53
Alcohol Past Month											
Total	Point Estimates	46.67	46.61	46.06	45.96	46.43	46.34	51.76	51.84	48.81	48.61
	SE1	0.40	0.40	1.72	1.78	1.73	1.72	1.48	1.49	1.55	1.57
	SE2	0.39	0.48	1.63	1.58	1.67	1.47	1.48	1.46	1.52	1.39
12-17	Point Estimates	16.46	16.36	14.81	14.87	16.15	15.90	18.38	18.25	17.87	17.85
	SE1	0.29	0.29	0.88	0.87	1.22	1.17	1.20	1.22	1.21	1.21
	SE2	0.30	0.32	0.87	0.93	1.94	1.56	1.23	1.22	1.21	1.21
18-25	Point Estimates	56.75	56.83	50.56	51.07	55.57	54.89	60.47	60.24	64.38	64.12
	SE1	0.50	0.51	1.95	1.98	2.31	2.25	1.51	1.53	1.86	1.84
	SE2	0.74	1.33	1.95	1.84	2.29	1.92	1.50	1.32	1.89	1.84
26-34	Point Estimates	58.20	58.22	55.90	55.91	59.14	58.60	61.52	61.91	65.14	64.71
	SE1	0.68	0.68	2.73	2.73	2.75	2.74	2.09	2.05	2.36	2.34
	SE2	0.75	1.61	2.67	2.44	2.68	2.45	2.10	1.92	2.36	2.24
35+	Point Estimates	46.91	46.80	48.19	47.86	46.75	46.86	53.05	53.11	46.84	46.70
	SE1	0.59	0.59	2.58	2.66	2.31	2.29	2.41	2.42	2.30	2.35
	SE2	0.57	0.55	2.55	2.35	2.24	2.02	2.40	2.30	2.27	2.15

(continued)

Table 6.5.5 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Month Licit Drug Estimates, Cigarettes and Alcohol: 2000 NHSDA (continued)

Variables	NY		OH		PA		TX		
	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	
Cigarettes Past Month									
Total	Point Estimates	22.72	22.71	27.96	28.01	25.30	25.26	22.79	22.80
	SE1	0.87	0.88	1.04	1.05	1.16	1.18	1.36	1.38
	SE2	0.92	1.00	1.04	1.00	1.17	1.01	1.42	1.43
12-17	Point Estimates	12.08	11.90	14.04	14.12	14.44	14.35	12.14	12.27
	SE1	1.07	1.07	0.97	0.98	0.97	0.96	1.08	1.08
	SE2	1.10	2.17	0.98	0.98	0.99	0.96	1.08	1.07
18-25	Point Estimates	35.59	35.87	44.51	44.30	43.35	43.33	31.70	31.59
	SE1	1.62	1.66	1.82	1.83	1.76	1.75	1.73	1.74
	SE2	2.28	4.91	1.79	1.63	1.79	1.75	3.09	2.10
26-34	Point Estimates	27.76	27.87	34.70	34.72	34.11	33.98	26.57	26.31
	SE1	1.92	1.94	1.80	1.84	2.07	2.01	1.87	1.88
	SE2	1.92	2.41	1.80	1.82	3.24	4.54	1.89	1.92
35+	Point Estimates	20.67	20.60	25.22	25.32	21.74	21.75	21.67	21.77
	SE1	1.30	1.29	1.59	1.60	1.74	1.75	2.05	2.07
	SE2	1.29	1.27	1.59	1.52	1.73	1.68	2.07	2.23
Alcohol Past Month									
Total	Point Estimates	49.06	48.98	48.24	48.19	49.97	49.70	42.02	42.02
	SE1	1.26	1.30	1.39	1.42	1.12	1.12	1.46	1.46
	SE2	1.41	1.44	1.38	1.30	1.09	1.04	1.37	1.29
12-17	Point Estimates	16.86	16.65	15.60	15.53	15.84	15.62	18.40	18.41
	SE1	1.13	1.15	1.04	1.05	1.00	1.01	1.17	1.15
	SE2	1.15	2.13	1.04	1.04	1.04	1.03	1.17	1.13
18-25	Point Estimates	58.93	59.36	60.77	60.63	63.19	63.18	54.02	53.57
	SE1	1.86	1.87	2.09	2.11	1.83	1.84	1.95	1.93
	SE2	4.17	3.31	2.09	1.92	1.85	1.72	4.78	2.38
26-34	Point Estimates	55.97	57.17	61.26	61.17	62.49	62.25	55.82	55.86
	SE1	2.04	2.00	2.09	2.12	2.40	2.48	2.58	2.60
	SE2	2.14	2.20	2.11	2.05	2.48	2.41	2.52	2.23
35+	Point Estimates	50.56	50.12	48.01	47.94	50.03	49.69	40.06	40.23
	SE1	2.10	2.17	1.99	2.02	1.77	1.77	2.28	2.28
	SE2	2.07	2.09	1.98	1.93	1.79	1.61	2.19	2.17

Table 6.5.6 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Month Illicit Drug Estimates, Marijuana and Cocaine: 2000 NHSDA

Variables		US		CA		FL		IL		MI	
		Baseline	Final								
Marijuana Past Month											
Total	Point Estimates	4.79	4.80	6.03	6.05	4.19	4.16	4.73	4.73	6.13	6.10
	SE1	0.13	0.13	0.50	0.50	0.46	0.45	0.47	0.48	0.62	0.61
	SE2	0.13	0.13	0.56	0.49	0.45	0.41	0.46	0.45	0.61	0.53
12-17	Point Estimates	7.14	7.19	7.46	7.61	7.52	7.59	7.71	7.68	8.17	8.21
	SE1	0.21	0.21	0.72	0.72	0.84	0.85	0.75	0.77	0.83	0.82
	SE2	0.21	0.24	0.75	0.73	0.85	0.85	0.78	0.78	0.83	0.82
18-25	Point Estimates	13.58	13.63	13.38	13.58	12.48	12.32	13.76	13.61	17.34	17.38
	SE1	0.34	0.34	1.38	1.37	1.13	1.17	1.62	1.60	1.43	1.45
	SE2	0.39	0.49	1.35	1.26	1.12	1.15	1.62	1.53	1.43	1.44
26-34	Point Estimates	5.82	5.87	8.35	8.65	5.73	5.80	4.65	4.78	7.68	7.73
	SE1	0.32	0.33	1.47	1.53	0.98	0.96	1.03	1.07	1.32	1.32
	SE2	0.35	0.51	1.56	1.59	0.97	0.92	1.03	1.07	1.33	1.31
35+	Point Estimates	2.29	2.28	3.41	3.29	2.11	2.08	2.27	2.29	3.02	2.95
	SE1	0.16	0.16	0.64	0.63	0.58	0.57	0.56	0.58	0.68	0.66
	SE2	0.16	0.15	0.66	0.61	0.57	0.54	0.56	0.56	0.68	0.61
Cocaine Past Month											
Total	Point Estimates	0.53	0.54	1.05	1.06	0.28	0.28	0.75	0.69	0.33	0.33
	SE1	0.05	0.05	0.33	0.33	0.06	0.06	0.21	0.18	0.09	0.08
	SE2	0.05	0.05	0.33	0.34	0.06	0.06	0.20	0.16	0.09	0.08
12-17	Point Estimates	0.56	0.56	0.54	0.54	0.36	0.36	0.29	0.26	0.24	0.25
	SE1	0.07	0.07	0.13	0.13	0.20	0.20	0.13	0.13	0.14	0.15
	SE2	0.07	0.07	0.13	0.13	0.20	0.20	0.13	0.13	0.14	0.14
18-25	Point Estimates	1.37	1.36	1.97	1.94	1.93	1.92	1.09	1.03	1.25	1.23
	SE1	0.11	0.11	0.50	0.49	0.46	0.46	0.30	0.29	0.37	0.36
	SE2	0.11	0.11	0.51	0.51	0.46	0.46	0.31	0.30	0.37	0.36
26-34	Point Estimates	0.75	0.80	0.42	0.44	0.31	0.32	1.02	1.06	0.55	0.54
	SE1	0.11	0.13	0.25	0.27	0.20	0.21	0.42	0.43	0.32	0.32
	SE2	0.11	0.12	0.25	0.26	0.20	0.22	0.42	0.43	0.32	0.32
35+	Point Estimates	0.30	0.31	1.10	1.13	0.00	0.00	0.69	0.60	0.10	0.10
	SE1	0.06	0.07	0.49	0.50	0.00	0.00	0.35	0.29	0.10	0.10
	SE2	0.06	0.07	0.49	0.53	0.00	0.00	0.35	0.27	0.10	0.10

(continued)

Table 6.5.6 Point Estimates, Ratio-Adjusted Standard Errors (SE1), and Sandwich Standard Errors (SE2) for Baseline and Final Models—Drug Estimates (U.S. and Eight Large States): Past Month Illicit Drug Estimates, Marijuana and Cocaine: 2000 NHSDA (continued)

Variables	NY		OH		PA		TX		
	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	
Marijuana Past Month									
Total	Point Estimates	4.22	4.23	4.42	4.38	4.55	4.69	2.91	2.92
	SE1	0.37	0.39	0.39	0.39	0.58	0.59	0.31	0.31
	SE2	0.37	0.70	0.39	0.40	0.71	0.83	0.31	0.30
12-17	Point Estimates	6.48	6.43	5.83	5.84	5.61	5.68	5.91	5.90
	SE1	0.68	0.68	0.54	0.55	0.67	0.71	0.76	0.78
	SE2	0.69	1.85	0.54	0.56	0.67	0.73	0.76	0.78
18-25	Point Estimates	16.38	16.32	14.83	14.74	15.15	15.23	9.52	9.62
	SE1	1.39	1.39	1.36	1.35	1.64	1.64	0.93	0.93
	SE2	1.56	5.30	1.36	1.31	1.66	1.63	1.20	0.96
26-34	Point Estimates	5.34	4.96	4.41	4.40	4.99	5.23	1.92	1.87
	SE1	0.91	0.89	0.78	0.76	0.95	0.98	0.55	0.54
	SE2	0.93	0.99	0.77	0.73	2.84	3.86	0.54	0.58
35+	Point Estimates	1.20	1.32	1.98	1.96	2.36	2.52	0.90	0.91
	SE1	0.40	0.45	0.55	0.55	0.69	0.71	0.37	0.38
	SE2	0.40	0.43	0.55	0.54	0.68	0.67	0.37	0.37
Cocaine Past Month									
Total	Point Estimates	0.45	0.45	0.26	0.25	0.45	0.50	0.48	0.49
	SE1	0.14	0.15	0.06	0.06	0.13	0.17	0.10	0.11
	SE2	0.14	0.16	0.06	0.06	0.13	0.16	0.11	0.11
12-17	Point Estimates	0.33	0.34	0.34	0.34	0.22	0.22	0.63	0.67
	SE1	0.17	0.17	0.20	0.19	0.14	0.13	0.18	0.19
	SE2	0.17	0.17	0.20	0.20	0.14	0.13	0.18	0.18
18-25	Point Estimates	0.85	0.83	1.49	1.48	1.53	1.53	1.95	1.93
	SE1	0.28	0.27	0.41	0.41	0.42	0.42	0.52	0.52
	SE2	0.29	0.27	0.41	0.41	0.42	0.42	0.55	0.53
26-34	Point Estimates	0.74	0.55	0.19	0.19	0.54	0.54	0.73	0.76
	SE1	0.45	0.33	0.19	0.19	0.32	0.32	0.44	0.46
	SE2	0.45	0.37	0.19	0.19	0.32	0.32	0.44	0.47
35+	Point Estimates	0.32	0.38	0.00	0.00	0.27	0.35	0.02	0.02
	SE1	0.16	0.20	0.00	0.00	0.18	0.24	0.02	0.02
	SE2	0.16	0.20	0.00	0.00	0.18	0.24	0.02	0.02

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Appendix A

Technical Details About the Generalized Exponential Model

APPENDIX A

Technical Details About the Generalized Exponential Model (GEM)

A.1 Distance Function

Let $\Delta(w, d)$ denote the distance between the initial weights $d = \{d_k : k \in s\}$ and the adjusted weights w , with k being the k^{th} unit in the sample, and s , the sample selected. The distance function minimized under the generalized exponential model (GEM) subject to calibration constraints is given by

$$\Delta(w, d) = \sum_{k \in s} \frac{d_k}{A_k} \left\{ (a_k - l_k) \log \frac{a_k - l_k}{c_k - l_k} + (u_k - a_k) \log \frac{u_k - a_k}{u_k - c_k} \right\} \quad (\text{A1.1})$$

where $a_k = w_k/d_k$, $A_k = (u_k - l_k)/(u_k - c_k)(c_k - l_k)$, and l_k, c_k, u_k are prescribed real numbers. Let T_x denote the p -vector of control totals corresponding to predictor variables (x_1, \dots, x_p , say). Then, the calibration constraints for the above minimization problem are

$$\sum_{k \in s} x_k d_k a_k = T_x, \quad (\text{A1.2})$$

The solution of the above minimization problem, if it exists, is given by a GEM with model parameters λ , i.e.,

$$a_k(\lambda) = \frac{l_k(u_k - c_k) + u_k(c_k - l_k) \exp \{A_k x_k' \lambda\}}{(u_k - c_k) + (c_k - l_k) \exp \{A_k x_k' \lambda\}} \quad (\text{A1.3})$$

Note that the number of parameters in GEM should be $\leq n$, where n is the size of the sample s . This is also the dimension of vectors d and w . It follows from (A1.3) that

$$l_k < a_k < u_k, \quad k = 1, \dots, n \quad (\text{A1.4})$$

The usual raking-ratio method (see e.g., Singh & Mohl, 1996) of weight adjustment is a special case of GEM by noting that for $l_k = 0$, $u_k = \infty$, $c_k = 1$, $k = 1, \dots, n$, we have

$$\Delta(w, d) = \sum_{k \in S} d_k a_k \log a_k - \sum_{k \in S} d_k (a_k - 1) \quad (\text{A1.5})$$

and $a_k(\lambda) = \exp(x_k' \lambda)$.

The logit method of Deville and Särndal (1992), is also a special case of GEM by setting $l_k = l$, $u_k = u$, $c_k = 1$ for all k .

A.2 GEM Adjustments for Extreme Value Treatment, Nonresponse, and Poststratification

By choosing the user-specified parameters l_k , c_k , and u_k appropriately, the unified GEM formula (A1.3) can be justified for all the three types of adjustment. Denote the winsorized weights by $\{b_k\}$ where $b_k = d_k$ if d_k is not an extreme weight, and $= \text{med}\{d_k\} \pm 3 * \text{IQR}$ if d_k is an extreme weight, where the quartiles for the weights are defined with respect to a suitable design-based stratum.

For the nonresponse (nr) adjustment, we first divide the sample in two parts, s_* the non-extreme weight subsample, and s_{**} the extreme weight subsample. For non-extreme weights, we set $l_2 = 1$, $c_2 = \rho^{-1}$, $u_2 = u > \rho^{-1}$, where ρ is the overall response propensity; and for extreme weights with high weights, we set $l_k = l_1 m_k$, $c_k = \rho^{-1} m_k$, $u_k = u_1 m_k$, where $m_k = b_k/d_k$, and $l_1 < 1 < \rho^{-1} = c_1 < u_1$ are prescribed numbers. Similarly, we set $l_k = l_3 m_k$, $c_k = \rho^{-1} m_k$, $u_k = u_3 m_k$, and $l_1 < \rho^{-1} = c_1 < u_1$ for extreme weights with low weights.

For the poststratification (ps) adjustment, we set for non-extreme weights, $l_k = l_2$, $c_k = c_2 = 1$, $u_k = u_2$, and for high extreme weights, $l_k = l_1 m_k$, $c_k = m_k$, $u_k = u_1 m_k$, and similarly for low extreme weights, $l_k = l_3 m_k$, $c_k = m_k$, $u_k = u_3 m_k$. The extreme value (ev) adjustment is identical to ps except for tighter bounds on extreme weights resulting from the final ps.

Notice that with GEM, there is the flexibility of specifying different bounds for different subsamples, as well as the lower bound (in the case of nr adjustments) can be made 1 by choosing the center $c_k > 1$.

A.3 Newton-Raphson Steps

Let X denote the $n \times p$ matrix of predictor values, and for the v th iteration,

$$\Gamma_{\phi^v} = \text{diag} (d_k \phi_k^{(v)}), \phi_k^{(0)} = 1,$$

where

$$\phi_k^{(v)} = (u_k - a_k^{(v)}) (a_k^{(v)} - l_k) / (u_k - c_k) (c_k - l_k);$$

then, at the Newton-Raphson iteration v , value of the p -vector λ is adjusted as

$$\lambda^{(v)} = \lambda^{(v-1)} + (X' \Gamma_{\phi, v-1} X)^{-1} (T_x - \hat{T}_x^{(v-1)}), \quad (\text{A3.1})$$

where $\lambda^{(0)} = \mathbf{1}$.

The convergence criterion is based on the Euclidean distance $\|T_x - \hat{T}_x^{(v)}\|$. At each iteration, it is checked whether it is decreasing or not. If not, then half-step is used in the iteration increment.

A.4 Scaled Constrained Exponential Model

In previous NHSDAs, constrained exponential models (CEM) were used for ps and scaled CEM for nr adjustments. The CEM refers to the logit model of Deville and Särndal (1992) in which lower and upper bounds do not vary with k (i.e., $l_k = l$, $u_k = u$, and $c_k = c = 1$ such that $l < 1 < u$). Thus, it is a special case of GEM. For the nr adjustment, Folsom and Witt (1994) modified CEM estimating equations by a scaling factor (ρ^{-1} : inverse of the overall response propensity) such that $1 < \rho^{-1} a_k < \rho^{-1} u$. This implies that by choosing l in CEM as ρ , one can ensure that the scaled adjustment factor for nonresponse is at least 1.

Appendix B

Derivation of Poststratification Control Totals

APPENDIX B

Derivation of Poststratification Control Totals

For poststratification (ps), we need quarterly State-specific totals for the target population (civilian, noninstitutionalized, aged 12 or older) for 80 demographic domains defined by age, race, gender, and Hispanicity ($5 \times 4 \times 2 \times 2$)¹. However, State-level estimates of the target population are not directly available from the Census Bureau's population projections branch. Therefore, a methodology for computing reliable estimates was developed. Currently available information for demographic includes the following:

- 2000 monthly national post-Censal estimates of the civilian, noninstitutionalized population;
- 2000 monthly national post-Censal estimates of the resident² population;
- 2000 State-level mid-year (July 1) projections of resident population; and
- 1990 census five percent public use microdata samples (PUMS).

For brevity within the following discussion, the terms "civilian" and "military" are used to represent "civilian and noninstitutionalized" and "military or institutionalized," respectively. Our objective is to develop quarterly estimates for the State-level civilian and military population for each domain (although only the civilian component is of interest) such that they represent State-level residential population counts by domain as well as represent the national-level estimates of civilian and military population counts by domain.

We used PUMS data to estimate the fraction of civilians relative to residents for each of the 80 domains for each State. Although archival data do not take into account population growth and migrations, it was believed that the estimated fractions of the civilian population may still be reasonable. Using these estimated fractions, we can complete a three-dimensional table in which rows reflect States, columns represent domains, and the layers are civilian versus military. A

¹ Age levels: 12-17, 18-25, 26-34, 35-49, 50+; race levels: White, Black, American Indian/Alaska Native, Asian; gender levels: Male, Female; Hispanicity levels: Non-Hispanic, Hispanic.

² Resident population includes civilian, military, institutionalized, and noninstitutionalized persons.

raking-ratio algorithm can be used to adjust the cell counts (see Exhibit B1) so that when collapsed over layers of civilians and the military, they match the State residential population by domain, and when collapsed over rows of States, they match the national civilian and military population by domain. However, before doing the raking, the State residential margins were ratio adjusted so that they matched the national residential population. This was needed for internal consistency of the marginal constraints.

To develop quarterly estimates, the raking was done for each quarter. For this purpose, monthly national population estimates were used to estimate quarterly estimates as follows. To arrive at quarter-level projections, the population projections at the midpoint of the quarter were approximated by simply averaging the last two monthly projections in the quarter that were obtained from the U.S. Census. So, for example, to arrive at projections for the first quarter of 1997, we simply averaged the February 1 and March 1 U.S. Census projections, thereby arriving at a population estimate appropriate for February 15 (i.e., the midpoint of Quarter 1). Next, the State-specific midyear projections were scaled so that they sum to the quarterly national estimates.

Exhibit B1 Raking-Ratio Derivation of Control Totals

By Quarter			
States (s)	Target Populations		
	Civilian / Noninstitutionalized (C) (PUMS Adjustment = α_{sd})	Military / Institutionalized (M) (PUMS Adjustment = $1-\alpha_{sd}$)	1999 Midyear (July 1) State Residential Projections (Rp)
	Domain (1 2 ..d ..D)	Domain (1 2 ..d ..D)	Domain (1 2 ..d ..D)
1	$T^C_{1d} = T^{Rp}_{1d} * (\alpha_{1d})$	$T^M_{1d} = T^{Rp}_{1d} * (1-\alpha_{1d})$	T^{Rp}_{1d}
2	$T^C_{2d} = T^{Rp}_{2d} * (\alpha_{2d})$	$T^M_{2d} = T^{Rp}_{2d} * (1-\alpha_{2d})$	T^{Rp}_{2d}
.	.	.	.
.	.	.	.
.	.	.	.
51	$T^C_{51d} = T^{Rp}_{51d} * (\alpha_{51d})$	$T^M_{51d} = T^{Rp}_{51d} * (1-\alpha_{51d})$	T^{Rp}_{51d}
National (e=estimates)	T^{Ce}_{*d}	$T^{Me}_{*d} = T^{Re}_{*d} - T^{Ce}_{*d}$	T^{Re}_{*d}

T^{e}_{*d} = National Quarter Residential Estimates for domain d.

Appendix C

Imputation Methodology

APPENDIX C

Imputation Methodology

C.1 Unweighted Hot Deck

The adjustments of dwelling unit (DU) poststratification (ps), poststratifying the selected sample to all eligible rostered persons and the person-level nonresponse, require the use of demographic information obtained from the screener interview. However, at the time of screening, the only required information for an individual is age, and so, some demographic information (i.e., gender, Hispanic origin, and race) may be missing. Therefore, some form of imputation was required for cases with missing data¹. This imputation was performed using an unweighted hot-deck methodology. The unweighted hot-deck method of imputing a variable with missing responses (which is called the base variable in this appendix) involves three basic steps.

1. *Forming Imputation Classes.* When a strong logical association exists between the base variable and certain auxiliary variables, we partitioned the data set by the auxiliary variables and implemented imputation procedures independently within classes defined by the cross of the auxiliary variables. For some variables, we sorted our file by these auxiliary variables first to essentially produce the same result.
2. *Sorting the File.* Within each imputation class, the file will be sorted by auxiliary variables that were relevant to the item being imputed. The sort order of the auxiliary variables was chosen to reflect the degree of importance of the auxiliary variables in their relation to the base variable being imputed (i.e., those auxiliary variables that were better predictors for the item being imputed were used as the first sorting variables).

For the computer-assisted interviewing (CAI) version of the 1999 NHSDA, two types of sorting procedures can be used to sort the files prior to imputation:

(1) Straight Sort—Where a set of variables was sorted in ascending order by the first variable specified, then within each level of the first variable the file was sorted in ascending order by the second variable specified, and so on. For example:

1	1	1
1	1	2

¹ Since the imputation of these demographic variables was not required for the main NHSDA analysis, it is documented here in the weighting report.

1	2	1
1	2	2
1	3	1
1	3	2
2	1	1
2	1	2
2	2	1
2	2	2
2	3	1
2	3	2

(2) Serpentine Sort—Where a set of variables was sorted so that the direction of the sort (ascending or descending) changes each time the value of a variable changes. For example:

1	1	1
1	1	2
1	2	2
1	2	1
1	3	1
1	3	2
2	3	2
2	3	1
2	2	1
2	2	2
2	1	2
2	1	1

The serpentine sort has the advantage of minimizing the change in the entire set of auxiliary variables every time any one of the variables changes its value.

3. *Replace Missing Values.* The file will be sorted and then read sequentially. Each time an item respondent is encountered (i.e., the base variable was non-missing), the base variable response will be stored, updating the donor response, and any subsequent nonrespondent encountered will receive the stored donor response creating the statistically imputed response. A starting value will be needed if an item nonrespondent is the first record on a sorted file. Typically, the response from the first respondent on the sorted file will be used as the starting value.

Note that because the file is sorted by relevant auxiliary variables, the preceding item respondent (donor) will closely match the neighboring item nonrespondent (recipient) with respect to the auxiliary variables.

For more information on the general hot-deck method of item imputation, see Little and Rubin 1987 (pp. 62-67).

With this type of imputation procedure, for any particular item being imputed there is the risk of several nonrespondents appearing next to one another on the sorted file. To detect this problem in the NHSDA, for every variable being imputed we also keep track of who the imputation donor is. Then, by examining frequencies by imputation donor, we can see if several

nonrespondents are lining up next to one another in the sort. When this problem occurs, we will add sort variables, eliminate sort variables, or rearrange the order of the sort variables.

C.2 Predictive Mean Neighborhood (PMN)

In the 1999 NHSDA (CAI) weighting process, the screener demographic information such as race, Hispanic origin, and gender was imputed using unweighted sequential hot-deck methodology (Singh, Grau, & Folsom, 2002), although the newly developed PMN methodology was used for the imputation of the questionnaire data. For 2000 NHSDA, the PMN methodology was also used for the imputation of race and Hispanic origin. The unweighted sequential hot-deck method was still used to impute gender for lack of a good set of predictors for PMN modeling. The unweighted sequential hot deck is simple and quick to implement, but it has a number of disadvantages.

- The first few sorting covariates almost entirely determine what donor will be used for a particular respondent with missing data, regardless of how many sorting covariates are included.
- There is no mechanism based on the data to weight the sorting covariates based on their relationship to the response variable.
- Weights are not used to determine the most appropriate donor for a respondent with missing data.
- The correlations across multiple outcome variables imputed to the same record is not accounted for when finding a donor.
- The choice of donor, after the sort has been completed, may be deterministic, which may introduce bias in estimating means and totals, and thus make it difficult to determine the variance of the estimator when taking account of imputation.

To address the deficiencies of the unweighted sequential hot deck, PMN was developed for the NHSDA. PMN is a combination of two commonly used imputation methods: a non-model-based hot deck and the model-based predictive mean matching method of Rubin. PMN enhances the predictive mean matching method in that it can be applied to both discrete and continuous variables either individually or jointly. PMN also enhances the nearest neighbor hot-deck method in that the distance function used to find neighbors is no longer ad hoc. PMN is easily applicable to problems of both univariate (UPMN) and multivariate (MPMN) imputations. UPMN is used for imputing a single continuous or dichotomous discrete variable independently, while MPMN imputation arises when values of two or more variables are missing for a single respondent or single polytomous variable with missing values.

The procedure for implementing UPMN and MPMN can be summarized with the following six steps. Steps 2 through 5, and sometimes Step 6, are cycled through each of the variables in the order determined by Step 1. Steps 4 and 5 (Steps 4 to 6 when applicable) could be considered a variant of a random nearest neighbor hot deck.

Step 1: Hierarchy definition. The first step is to determine the order in which variables are modeled, so that variables early in the hierarchy may be used for modeling the conditional predictive mean, i.e., they have the potential to be part of the set of covariates for variables later in the hierarchy.

For each variable:

Step 2: Setup for model building and hot deck assignment. For each model that is fitted, complete and incomplete data group must be created.

Step 3: Sequential hierarchical modeling. Build the model using the complete data respondents only, with weights adjusted for item non-response.

Step 4: Computation of predictive means and delta neighborhoods. The predictive means for item respondents and item nonrespondents are calculated using the model coefficients. Now, those item respondents whose predictive means are determined to be “close” (based on a distance function taking values within delta) to the item nonrespondents are considered part of the “delta” neighborhood.

Step 5: Assignment of imputed values using a univariate predictive mean (UPMN). Using a simple random draw from the neighborhood developed in Step 4, a donor is chosen for each item nonrespondent.

Go to step 6 if the variables for which Steps 2 to 5 have been completed are part of a complete multivariate set, for which MPMN is to be applied. Go to Step 2 if the variables for which Steps 2 to 5 are completed are not part of a complete multivariate set, and other variables are still to be imputed. Otherwise, the process is finished.

Step 6: Determination of multivariate predictive mean neighborhood and assignment of imputed values (MPMN). With the MPMN, the neighborhood is defined based on a vector of predictive means, rather than from a single predictive mean as in the univariate case.

The PMN methodology addresses all of the shortcomings of the unweighted sequential hot deck method. The PMN methodology has been widely used for the imputation of a variety of variables in the NHSDA, including both continuous and categorical variables with one or more levels. The models were fit using standard modeling procedures in SAS and SUDAAN, while SAS macros were used to implement the hot deck step, including the restrictions on the neighborhoods. Although creating a different neighborhood for each item non-respondent was computationally intensive, the method was implemented successfully. For more details on PMN, see Grau, Bowman, Giacoletti, Odum, & Sathe (2001).

Appendix D

GEM Modeling Summary

APPENDIX D

GEM Modeling Summary

Introduction

This appendix summarizes each model group throughout all stages of weight calibration modeling. Unlike much of the other information presented in this report, this section provides a model specific overview of weight calibration, as opposed to a State or domain specific one.

This year's modeling involved taking nine model groups through five adjustment steps: (1) dwelling unit level nonresponse adjustment, (2) dwelling unit level poststratification, (3) selected person-level poststratification, (4) person-level nonresponse adjustment, and (5) responding person-level poststratification. The post-design adjusted sampling weights for this year were reasonably distributed and did not require the additional treatment of the ev step at either the dwelling unit level or person-level stage.

Model specific summary statistics are shown in Tables D1a, D1b to D9a, D9b. Included in these tables, for each stage of modeling, are: the number of effects controlled for directly, the high, low, and non-extreme weight bounds set to provide the upper and lower limits for the GEM macro, weighted, unweighted and winsorized weight proportions, the unequal weighting effect, and weight distributions. The unequal weighting effect (UWE) provides an approximate measure of variance and establishes how much impact a particular stage of modeling has on the distribution of the new product of weights. For more detail on bounds, see Section 4.2. At each stage in the modeling, these summary statistics were calculated and utilized to help evaluate the quality and validity of the current product of weights and the model constructed.

Circumstances such as sample sizes and exact linear combinations in the realized data lead to situations whereby modeling using originally proposed levels of covariates is not possible. The text in and exhibits in Sections D1 to D9 summarizes the decisions made with regard to final covariates included in each model. For a list of the proposed initial covariates considered at each stage of modeling, see Exhibits D.1 to D.3, and for the list of realized final model covariates, see Exhibits D1.1 to D9.5. The following sections establish a series of guidelines to assist in their interpretation.

D.1 Final Model Explanatory Variables

For brevity, numeric abbreviations for factor levels are established in Exhibit 3.1 (included here as Exhibit D.1 for easy reference) in Chapter 3. There, a complete list is provided of all variables and associated levels used at any stage of modeling. Note that not all factors or levels are present in all stages of modeling, and the initial set of variables is the same across model groups but changes for each stage of modeling. The initial candidates are found in any of the proposed variables columns for a particular stage of weight adjustment. Exhibits D1.1-D9.5 provide lists of the proposed and realized covariates.

To help understand what effects are controlled for at each stage of the modeling, it may be useful to create cross-classification tables as shown in Section D.3. Sections D.2 and D.3 explain how to use various exhibits for selected model variables to construct these tables. For greater detail on why variable levels are collapsed or dropped, see Section 4.7.

Exhibit D.1 Definitions of Levels for Variables

Age

1: 12-17, 2: 18-25, 3: 26-34, 4: 35-49, 5: 50+¹

Gender

1: Male, 2: Female¹

Group Quarter Indicator

1: College Dorm, 2: Other Group Quarter, 3: Non-Group Quarter¹

Hispanicity

1: Hispanic, 2: Non-Hispanic¹

Percent of Owner-Occupied Dwelling Units in Segment (% Owner)

1: 50% - 100%,¹ 2: 10% - > 50%, 3: 0 - >10%

Percent of Segments That Are Black (% Black)

1: 50% - 100%, 2: 10% - >50%, 3: 0 - >10%¹

Percent of Segments That Are Hispanic (% Hispanic)

1: 50% - 100%, 2: 10% - >50%, 3: 0 - >10%¹

Population Density

1: MSA 1,000,000 or more, 2: MSA less than 1,000,000, 3: Non-MSA urban, 4: Non-MSA rural¹

Quarter

1: Quarter 1, 2: Quarter 2, 3: Quarter 3, 4: Quarter 4¹

Race (3 level)

1: White,¹ 2: Black, 3: Other

Race (4 level)

1: White,¹ 2: Black, 3: American Indian/Alaska Native, 4: Asian

Relation to Householder

1: Householder or Spouse, 2: Child, 3: Other Relative, 4: Non-Relative¹

Segment Combined Median Rent and Housing Value (Rent/Housing)²

1: First Quintile, 2: Second Quintile, 3: Third Quintile, 4: Fourth Quintile, 5: Fifth Quintile¹

States³

Model Group 1: 1: Connecticut, 2: Maine, 3: New Hampshire, 4: Rhode Island, 5: Vermont,
6: Massachusetts¹

Model Group 2: 1: New Jersey,¹ 2: New York, 3: Pennsylvania

Model Group 3: 1: Illinois, 2: Indiana,¹ 3: Michigan, 4: Wisconsin, 5: Ohio

Model Group 4: 1: Iowa, 2: Kansas, 3: Minnesota, 4: Missouri,¹ 5: Nebraska, 6: South Dakota,
7: North Dakota

Model Group 5: 1: Delaware, 2: District of Columbia, 3: Georgia,¹ 4: Maryland, 5: North
Carolina, 6: South Carolina, 7: Virginia, 8: West Virginia, 9: Florida

Model Group 6: 1: Alabama, 2: Kentucky, 3: Mississippi, 4: Tennessee¹

Model Group 7: 1: Arkansas,¹ 2: Louisiana, 3: Oklahoma, 4: Texas

Model Group 8: 1: Colorado, 2: Idaho, 3: Montana, 4: Nevada, 5: New Mexico, 6: Utah, 7: Wyoming,
8: Arizona¹

Model Group 9: 1: Alaska, 2: Hawaii, 3: Oregon, 4: Washington,¹ 5: California

¹ The reference level for this variable. This is the level against which effects of other factor levels are measured.

² Segment combined Median Rent and Housing Value is a composite measure based on rent, housing value, and percent owner occupied.

³ The States or district assigned to a particular model are based on Census divisions.

D.2 Glossary of Terms Used in the Description of the Variables in the Final Model

Factor effect. Represents the effects of levels considered for one-factor, two-factor, and higher order factors.

Reference/reference set. Factor effects composed of reference levels are not explicitly listed in the set of model variables. However, these effects manifest themselves either separately or in combination with other factors depending on the presence of other factors in the model.

All levels present. All effects and all levels of the factor under consideration are in the model.

Collapse (*levels*). Collapse these factor effects together. Factor effects that have been collapsed with others manifest themselves jointly in the model.

Keep *level(s)*. Keep these factor effects in the model and drop the remainder into the reference set.

Drop all levels. All factor effects are completely removed from the model for all levels and any combinations involving this factor.

Drop *level(s)*. Collapse these factor effects into the reference set. The factor effects comprising the dropped levels are manifested jointly with either some of or all of the factor effects in the reference set.

Drop *level(s)* due to singularity/zero sample. During the modeling process the factor effects listed were removed from the model due to either singularity or zero sample.

Factor levels collapsed/dropped at lower order. One or more of the effects in a higher order interaction was collapsed or dropped in an interaction at a lower order, either eliminating or combining factors of higher order interactions with that effect.

Do the same for (effects). Repeat the previous step for all effect levels listed.

Drop or Collapse using *. The asterisk is used as a wildcard character to indicate all levels of the factor for that effect.

*Note: The above are given as a list of general terms. Certain other specific terms are sometimes used within a particular section.

D.3 How to Interpret Collapsing and Dropping of Factor Effects

To help visualize what effects are directly controlled for in our model, one can construct the table that reflects the collapsing scheme employed. The following is a complex example from the 1999 modeling.

1. Locate the Factor effect - Model 9 Person Nonresponse Adjustment:

Three Factor	Final Variable
State * Age * Race (3 Level)	Factor levels collapsed at lower order. Drop (3,4,2) due to collinearity. Collapse (1,4,2) & (1,4,3). Drop (3,*,*). Collapse (4,1,2) & (4,1,3). Do the same for each level of age in that State.

2. Determine the initial range of possible levels for a full cross and full breakdown of the variables by referencing the variable definitions shown in the exhibits:

- **State** (for the model group in question, in this case, Model Group 9)

Model Group 9: 1: Alaska, 2: Hawaii, 3: Oregon, 4: Washington, 5: California^{1,2,3}

- **Age**

1: 12-17,^{2,3} 2: 18-25, 3: 26-34, 4: 35-49, 5: 50+¹

- **Race (3 levels)**

1: White,^{1,2,3} 2: Black, 3: Other

Note that superscript number indicates the reference level of the variable for a particular stage of modeling. In our case, the model stage is “person nonresponse adjustment.”

3. Construct the cross-classification table.

For example, Race (4 Level) is defined this way:

Race (4 Level)	White	Black	Asian	American Indian/Alaska Native
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 Indicates the reference-level set.

This is the cross-classification table for State * Race (4 Level):

State*Race (4 Level)	White	Black	Asian	American Indian/Alaska Native
AK				
HI				
OR				
WA				
CA				

 Indicates the reference-level set.

The cross-classification table of interest is as follows:

State*Age * Race (3 Level)	White	Black	Other
AK * 12-17			
18-25			
26-34			
35-49			
50+			
HI * 12-17			
18-25			
26-34			
35-49			
50+			
OR * 12-17			
18-25			
26-34			
35-49			
50+			
WA * 12-17			
18-25			
26-34			
35-49			
50+			
CA * 12-17			
18-25			
26-34			
35-49			
50+			

 Indicates the reference-level set.

Within each cell of the table would appear the number of respondents in that class at this stage of modeling. Construction of the other cross-classification tables follows the same logic and is only necessary to the point of providing understanding of the final table.

4. Use the final variable definition to construct the combination of factors controlled.

Factor effect collapsed at lower order. Because this note is present, we should examine the lower order factor effects our cross of interest combines:

One-Factor Effects Final Variable

State All levels present
 Race (4 Levels) All levels present
 Age All levels present

Two-Factor Effects Final Variable

State * Age All levels present
 State * Race (4 Levels) Collapse (1,3) & (1,4). Do the same for all other States except (2). Collapse (2,2), (2,3), & (2,4).
 Age * Race (3 Levels) All levels present

The reason for the note is the State * Race (4 Levels) interaction. It indicates a need to maintain its collapsing scheme when setting up any three-factor crosses involving State * Race.

State*Race (4 Level)	White	Black	Asian	American Indian/Alaska Native
AK				
HI				
OR				
WA				
CA				

 Indicates the reference-level set.

Returning to our instructions, we see that several other factor crosses have been affected by modeling:

State * Age * Race (3 Level) Factor levels collapsed at lower order. Drop (3,4,2) due to collinearity. Collapse (1,4,2) & (1,4,3). Drop (3,*,*). Collapse (4,1,2) & (4,1,3). Do the same for each level of age in that State.

Note that race has been collapsed to three levels. Construct the complete table, then begin combining blocks as directed. The unshaded cells represent the factors directly controlled for by the logistic model. The shaded cells represent the composite reference set.

After following the directions, the cross-classification table should appear as follows:

State*Age * Race (3 Level)	White	Black	Other
AK * 12-17			
18-25			
26-34			
35-49			
50+			
HI * 12-17			
18-25			
26-34			
35-49			
50+			
OR * 12-17			
18-25			
26-34			
35-49			
50+			
WA * 12-17			
18-25			
26-34			
35-49			
50+			
CA * 12-17			
18-25			
26-34			
35-49			
50+			

 Indicates the reference-level set.

Exhibit D.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)

Variables	Level	Proposed
One-Factor Effects		
Intercept	1	1
State	Model Specific	
Quarter	4	3
Population density	4	3
Group quarter	3	2
%Black	3	2
%Hispanic	3	2
%Owner-occupied	3	2
Rent/housing value	5	4
Two-Factor Effects		
%Owner × %Black	3 × 3	4
%Owner × %Hispanic	3 × 3	4
%Owner × Rent/housing	3 × 5	8
Rent/housing × %Black	3 × 5	8
Rent/housing × %Hispanic	3 × 5	8
State × Quarter	Model Specific	
State × Pop. density	Model Specific	
State × Group quarter	Model Specific	
State × %Black	Model Specific	
State × %Hispanic	Model Specific	
State × %Owner-occupied	Model Specific	
State × Rent/housing	Model Specific	
Three-Factor Effects		
State × %Owner × %Black	Model Specific	
State × %Owner × %Hispanic	Model Specific	
State × %Owner × Rent/housing	Model Specific	
State × Rent/house × %Black	Model Specific	
State × Rent/house × %Hispanic	Model Specific	

Exhibit D.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps and res.per.ps)

Variables	Level	Proposed
One-Factor Effects		
Intercept	1	1
State	Model Specific	
Quarter	4	3
Age	5	4
Race (4 level)	4	3
Gender	2	1
Hispanicity	2	1
Two-Factor Effects		
Age × Race (3 level)	5 × 3	8
Age × Hispanicity	5 × 2	4
Age × Gender	5 × 2	4
Race (3 level) × Hispanicity	3 × 2	2
Race (3 level) × Gender	3 × 2	2
Hisp × Gender	2 × 2	1
State × Quarter	Model Specific	
State × Age	Model Specific	
State × Race (4 level)	Model Specific	
State × Hispanicity	Model Specific	
State × Gender	Model Specific	
Three-Factor Effects		
Age × Race (3 level) × Hispanicity	5 × 3 × 2	8
Age × Race (3 level) × Gender	5 × 3 × 2	8
Age × Hispanicity × Gender	5 × 2 × 2	4
Race3 × Hispanicity × Gender	3 × 2 × 2	2
State × Age × Race (3 level)	Model Specific	
State × Age × Hispanicity	Model Specific	
State × Age × Gender	Model Specific	
State × Race (3 level) × Hispanicity	Model Specific	
State × Race(3 level) × Gender	Model Specific	
State × Hispanicity × Gender	Model Specific	

Exhibit D.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps, res.per.nr)

Variables	Levels	Proposed
One-Factor Effects		
Intercept	1	1
State	Model Specific	
Quarter	4	3
Age	5	4
Race (4 level)	4	3
Gender	2	1
Hispanicity	2	1
Relation to Householder	4	3
Population Density	4	3
Group Quarter	3	2
%Black	3	2
%Hispanic	3	2
%Owner-occupied	3	2
Rent/house value	5	4
Two-Factor Effects		
Age × Race (3 level)	5 × 3	8
Age × Hispanicity	5 × 2	4
Age × Gender	5 × 2	4
Race (3 level) × Hispanicity	3 × 2	2
Race (3 level) × Gender	3 × 2	2
Hispanicity × Gender	2 × 2	1
%Owner × %Black	3 × 3	4
%Owner × %Hispanicity	3 × 3	4
%Owner × Rent/housing	3 × 5	8
Rent/housing × %Black	3 × 5	8
Rent/housing × %Hispanic	3 × 5	8
State × Quarter	Model Specific	
State × Age	Model Specific	
State × Race (4 level)	Model Specific	
State × Hispanicity	Model Specific	
State × Gender	Model Specific	
State × %Black	Model Specific	
State × %Hispanic	Model Specific	
State × %Owner-occupied	Model Specific	
State × Rent/housing	Model Specific	
Three-Factor Effects		
Age × Race (3 level) × Hispanicity	5 × 3 × 2	8
Age × Race (3 level) × Gender	5 × 3 × 2	8
Age × Hispanicity × Gender	5 × 2 × 2	4
Race (3 level) × Hispanicity × Gender	3 × 2 × 2	2
State × Age × Race (3 level)	Model Specific	
State × Age × Hispanicity	Model Specific	
State × Age × Gender	Model Specific	
State × Race (3 level) × Hispanicity	Model Specific	
State × Race (3 level) × Gender	Model Specific	
State × Hispanicity × Gender	Model Specific	

Appendix D1

Model Group 1: New England

Table D1a 2000 NHSDA Person Weight GEM Modeling Summary (Model Group 1: New England)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	2.21%	4.36%	0.02%	1.51324	310	(1.0, 1.2)	(1.08, 1.20)
	0.99%	1.39%	0.00%	1.52849	98	(1.0, 2.2)	(1.00, 2.18)
						(1.0, 2.2)	(1.05, 1.07)
<i>res.sdu.ps</i>	0.99%	1.39%	0.00%	1.52845	226	(0.28, 1.1)	(0.28, 1.10)
	1.36%	3.10%	0.55%	1.58554	203	(0.28, 2.8)	(0.28, 2.80)
						(0.9, 2.8)	(0.90, 2.79)
<i>sel.per.ps</i>	2.68%	4.60%	0.88%	3.74914	326	(0.3, 2.2)	(0.30, 2.20)
	1.81%	4.20%	0.97%	3.99466	233	(0.3, 3.6)	(0.30, 3.60)
						(0.6, 3.6)	(0.60, 3.05)
<i>res.per.nr</i>	1.94%	4.11%	0.89%	3.86747	326	(1.0, 1.8)	(1.00, 1.80)
	1.16%	4.09%	0.82%	4.40605	168	(1.0, 3.8)	(1.00, 3.80)
						(1.0, 3.8)	(1.00, 2.93)
<i>res.per.ps</i>	1.23%	4.52%	0.98%	4.40605	226	(0.28, 1.2)	(0.28, 1.20)
	1.18%	2.88%	0.46%	4.42354	145	(0.28, 2.3)	(0.28, 2.30)
						(0.9, 2.3)	(0.90, 1.09)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum / minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

Table D1b Distribution of Weight Adjustment Factors and Weight Products (Model Group 1: New England)

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	33.30	0.45	69	0.28	20	30.38	0.16	9	0.38	10	0.12	4
1%	65.38	1.00	70	0.28	59	65.24	0.31	44	0.99	50	0.28	28
5%	93.27	1.04	98	0.75	84	108.29	0.65	106	1.00	126	0.39	114
10%	111.76	1.06	121	0.87	115	147.53	0.78	143	1.05	162	0.90	151
25%	149.54	1.07	161	0.94	163	252.17	0.89	251	1.16	307	0.95	297
Median	217.16	1.09	232	1.02	250	711.35	1.00	681	1.26	856	1.01	851
75%	832.46	1.11	585	1.13	547	1485.84	1.12	1,500	1.41	1,940	1.06	1,971
90%	718.94	1.15	791	1.31	831	3100.92	1.26	3,143	1.69	4,140	1.14	4,130
95%	786.87	1.20	901	1.44	940	5792.69	1.42	6,619	1.96	8,616	1.37	9,040
99%	885.44	1.32	1,072	1.89	1,170	12592.70	2.20	13,580	3.54	20,043	2.29	19,499
Maximum	1153.97	6.58	1,168	3.00	3,002	24747.50	3.60	34,850	3.80	41,586	2.65	57,338
Max/Mean	4	5.98	4	3.20	8	17	3.51	24	17.80	21	20.80	29

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 1 Overview

Dwelling Unit Nonresponse

Main effects were modified by combining group quarter level 'college dorm' with 'other group quarter.' Zero counts led to the removal of all population density 'MSA 1,000,000 or more' counts except Connecticut. State group quarter levels were redefined, as per the main effects, as 'college dorm' plus 'other group quarter' for all states to preserve the hierarchy of the model. Connecticut was the only State able to support full segment level percent 'black' variables. Rhode Island was able to support the '50-100%' level. State level segment percent Hispanic was maintained only a few specific instances: '<10%' in Rhode Island and '10-50%' in Connecticut, New Hampshire, and Rhode Island. A few of the within State '10-50% owner-occupied' levels were retained in the model: Connecticut, Maine, New Hampshire, and Rhode Island, and one '50-100%' in Rhode Island was left. Scattered segment level rent/housing variables were kept: Maine's first quintile, New Hampshire, and Rhode Island's second and third quintiles, and the fourth quintile in Connecticut and Rhode Island. The interaction of the segment variables owner-occupied and percent 'black' was left mostly intact, excluding only the '50-100% owner-occupied' by '10-50% black.' Likewise, '10-50% owner-occupied' by '<10% Hispanic' was eliminated. The interactions between level three of percent owner-occupied and quintiles one through four of rent/housing were collapsed into the fifth quintile. Within rent/housing by percent 'black,' all interactions of percent '<10% black' were eliminated and the interaction between the first quintile of rent/housing and '10-50% black' was dropped. For rent/housing by percent Hispanic, '<10% Hispanic' was eliminated for both quintiles one and two of rent/housing. In addition, the interaction of quintile one and '10-50% Hispanic' was also dropped.

The vast majority of three-factor effects were removed due to singularities, exact linear combinations, prior collapses, low counts, and nonconvergence. Segment level effects interacting at the three-factor level were greatly reduced due to lack of sample. State owner-occupied by percent 'black' and State owner-occupied by percent Hispanic were all eliminated because of small cell counts. State owner-occupied by rent/housing, level two of percent owner-occupied by quintiles one and three of rent/housing were retained for Maine and Rhode Island, respectively, and New Hampshire's quintiles two and three of rent/housing by '10-50% owner-occupied' remained. State by rent/housing by percent 'black' had only the interaction between the fourth quintile of rent/housing and level two of percent 'black' for Connecticut kept in the model. Lastly, within State by rent/housing by percent Hispanic, '10-50% black' by quintiles three and four of rent/housing were kept for Rhode Island and Connecticut respectively.

Dwelling Unit Poststratification

All one-factor effects were included in the model. All two-factor effects were included in the model with the exception of some State by race interactions. Here, the 'American Indian/Alaska Native' and 'Asian' levels of race were collapsed within the states of New Hampshire, Rhode Island, and Vermont.

In addition, all three-factor effects were included in the model with the exception of some of the State by age by race, State by race by Hispanicity interactions, and State by race by gender interactions. For the State by age by race interactions, the age group of 35 to 49 for 'black' was dropped for the state of Vermont. 'Black' and 'other' were collapsed within the age group of 26 to 34 for the state of Vermont. 'Black' and 'other' were also collapsed within all age groups for the states of Maine, New Hampshire and Rhode Island. With respect to the State by race by Hispanicity interactions, Hispanic 'black' and Hispanic 'other' for both New Hampshire and Rhode Island as well as Hispanic 'other' respondents for Maine were dropped. In the State by race by gender interactions, males with a race of 'black' or 'other' were collapsed for the state of New Hampshire.

(Selected) Person-Level Poststratification

All main effects were included in the model. Singularities eliminated the following two-factor interactions: the second level of owner-occupied in its interaction with percent Hispanic; '50-100% owner-occupied' by the third quintile of rent/housing; '0-50% black' in Maine, New Hampshire, and Vermont; '<10% black' for Rhode Island; '<10% Hispanic' in Connecticut, New Hampshire, Rhode Island, Maine, and Vermont; and, finally, '<10% Hispanic' in Maine and Vermont.

Two-factor effects that were collapsed include the following: '<10% black' with '10-50% black' for all rent/housing levels, rent/housing quintile 1 and quintile 2 for all percent 'black' levels, percent housing quintile 1 and quintile 2 for '<10% black' and '10-50% black,' '<10% black' and '10-50% black' for all levels of rent/housing, and 'American Indian/Alaska Native' with 'Asian' in Vermont. In addition, Connecticut, Maine, and Vermont '50-100% owner-occupied' were removed and rent/housing quintiles one through three for Connecticut, two through four for Maine, one and four for New Hampshire, one for Rhode Island, and one through four for Vermont were eliminated from the model.

Within three-factor effects, all age by race by Hispanicity and race by Hispanicity by gender interactions were dropped due to convergence problems. 'Black' and 'other' were combined for age by race by gender, State by age by race, State by race by Hispanicity, and State by race by

gender interactions. In addition, the reference age level was redefined to 35 or older for Maine, New Hampshire and Vermont. Hispanicity by age category 35 to 49 was dropped into the reference cell for Maine and Vermont, Hispanicity by age 26 to 34 was dropped into the reference cell for Vermont, and the Hispanicity by race for Maine and Rhode Island were eliminated from the model.

(Respondent) Person-Level Nonresponse

All one-factor effects were included in the model. In two-factor effects, race level 'other' was crossed with an age reference redefined as 26 or older. Variables that were dropped from the model due to exact linear combinations, zero counts, singularities or nonconvergence include the following: '10-50% owner-occupied' by Hispanicity, '<10% owner-occupied' by rent/value quintile three; rent/value quintiles one through four by '50-100% black'; rent/value quintiles one and two by '10-50% black'; rent/value quintiles one and two by '50-100% Hispanic'; rent/value quintiles one and two by percent '10-50% Hispanic'; race 'American Indian/Alaska Native' and race 'Asian' and Hispanicity by state of Connecticut; Hispanicity by Rhode Island; '50-100% black' by Maine, New Hampshire, Vermont, and Rhode Island; '10-50% black' by Maine, New Hampshire, and Vermont; '50-100% Hispanic' by Maine, New Hampshire and Vermont; '10-50% Hispanic' by Maine and Vermont; '<10% owner-occupied' by Connecticut, Maine, and Vermont; rent/value first quintile by Connecticut, Vermont, New Hampshire, and Rhode Island; rent/value quintiles two and three by Connecticut, Vermont, and Maine; and rent/value fourth quintile by Maine, New Hampshire, and Vermont. Some variables also had to be collapsed. Levels of race 'black' and 'other' were collapsed for both Hispanicity and gender. Levels of race 'American Indian/Alaska Native' and 'Asian' were collapsed for Maine, Rhode Island, and Vermont. Levels of race 'black,' 'American Indian/Alaska Native' and 'Asian' were collapsed for New Hampshire.

In three-factor effects, many interactions had to be dropped or collapsed in order to preserve hierarchy of the model or to eliminate convergence problems. Terms that were collapsed and kept in the model include Race level 'black' and 'other,' and were collapsed for Hispanics and for males in age groups 12 to 17 and 18 to 25 (the 'black/other' by males for ages 18 to 25 was later dropped from the model) (3 terms), and males in age group 12 to 17 and age group 18 to 25 were collapsed across Vermont and New Hampshire (2 terms). Many other terms were collapsed and later dropped from the model for convergence. As a result of convergence problems and the preservation of hierarchy, the only other terms that were kept in the model were Hispanic males age 12 to 17, race 'black' and race 'other' by age 12 to 17, 18 to 25, and interactions with age 18 to 25 for Maine and Rhode Island, and Hispanic males age 12 to 17 and age 18 to 25 for Maine and Rhode Island.

(Respondent) Person-Level Poststratification

For this final step, all main effects were included in the New England model. Two factor interactions were limited by removing 'other' from the interaction of race with Hispanicity, combining 'black' and 'other' for age groups 26 to 34 and 35 to 49 in the age and race interaction, and collapsing 'American Indian/Alaska Native' and 'Asian' in Maine, New Hampshire, Rhode Island, and Vermont samples.

A large number of higher order three-factor effects were removed from the model due to the usual constraints of zero sample, collinearity, non-zero reference levels, or convergence problems. Of those remaining, effects corresponding to Hispanic 'blacks' in age groups 12 to 17 and 18 to 25, were maintained for the Hispanicity, race, and age interaction. The same age groups were kept for the age, race, gender interaction with the addition of a 26 to 34 age level with combined 'black' and 'other' samples. Moving on to effect interactions within States, all State by age by gender interactions were kept at originally proposed levels, but State, age interactions with race and Hispanicity were reduced. The interaction involving race retained all race levels for the 12 to 17 and 18 to 25 ranges within Connecticut and Rhode Island, and the 12 to 17 range for Maine, but no others. The Hispanicity interaction was maintained in full for all Connecticut age groups, the 12 to 17 range in Rhode Island, and the 18 to 25 range in Maine. State, race, gender crosses required exclusion of Vermont and the collapse of race 'black' and 'other' within Connecticut. Hispanicity by race was reduced to representation within only one State, Connecticut, and the combination of states in the reference. Connecticut was one of three States, Maine and New Hampshire being the other two, that supported Hispanicity by gender breakdowns.

**Exhibit D1.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 1: New England**

Variables	Level	Proposed	Final
One-Factor Effects		24	23
Intercept	1	1	All levels present.
State	6	5	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		122	68
State × Quarter	6*4	15	All levels present.
State × Pop. Density	6*4	15	11 - Drop (2,1), (3,1), (4,1), & (5,1).
State × Group Quarter	6*3	10	5 - Factor levels collapsed at lower order.
State × %Black	6*3	10	3 - Keep (1,1), (1,2), & (4,2). Drop remainder due to nonconv.
State × %Hispanic	6*3	10	4 - Keep (4,1), (1,2), (3,2), & (4,2).
State × %Owner-occupied	6*3	10	5 - Keep (1,2), (2,2), (3,2), (4,2), & (4,3).
State × Rent/housing	6*5	20	7 - Keep (2,1), (3,2), (4,2), (3,3), (4,3), (1,4), & (4,4).
%Owner × %Black	3*3	4	3 - Drop (3,2).
%Owner × %Hispanic ³ *3	4		3 - Drop (2,1).
%Owner × Rent/housing	3*5	8	4 - Drop (3,*).
Rent/housing × %Black	3*5	8	3 - Drop (*,1) & (1,2).
Rent/housing × %Hispanic	3*5	8	5 - Drop (1,1), (1,2), & (2,1).
Three-Factor Effects		160	7
State × %Owner × %Black	6*3*3	20	0 - Drop all levels due to zero counts.
State × %Owner × %Hispanic	6*3*3	20	0 - Drop all levels due to zero counts.
State × %Owner × Rent/house	6*3*5	40	4 - Keep (2,2,1), (3,2,2), (3,2,3), & (4,2,3).
State × Rent/house × %Black	6*3*5	40	1 - Keep (1,4,2). Drop remainder due to nonconv.
State × Rent/house × %Hispanic	6*3*5	40	2 - Keep (1,4,2), (4,3,2). Drop remainder due to nonconv.
Total		310	98

**Exhibit D1.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 1: New England**

Variables	Level	Proposed	Final
One-Factor Effects			
	18	18	
Intercept	1	1	All levels present.
State	6	5	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects			
		8	178
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hisp	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	6*4	15	All levels present.
State × Age	6*5	20	All levels present.
State × Race(4 level)	6*4	15	12 - Collapse (3,3) & (3,4). Do the same for States (4) & (5).
State × Hispanicity	6*2	5	All levels present.
State × Gender	6*2	5	All levels present.
Three-Factor Effects			
		127	107
Age × Race(3) × Hispanicity	5*3*2	8	All levels present.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2		2All levels present.
State × Age × Race(3 level)	6*5*3	40	26 - Drop (5,4,2). Collapse (5,3,2) & (5,3,3). Collapse (2,1,2) & (2,1,3). Do the same for each level of age and the same for States (3) & (4).
State × Age × Hispanic	6*5*2	20	All levels present.
State × Age × Gender	6*5*2	20	All levels present.
State × Race(3 level) × Hispanicity	6*3*2	10	5 - Drop (3,*,1), (4,*,1), & (2,3,1).
State × Race(3 level) x Gender	6*3*2	10	9 - Collapse (3,2,1) & (3,3,1).
State × Hispanicity × Gender	6*2*2	5	All levels present.
Total		226	203

**Exhibit D1.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 1: New England**

Variables	Levels	Proposed	Final
One-Factor Effects		36	36
Intercept	1	1	All levels present.
State	6	5	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		163	122
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	3 - Drop (2,1) due to sing.
%Owner × Rent/housing	3*5	8	7 - Drop (3,3) due to sing.
Rent/housing × %Black	3*5	8	3 - Collapse (1,1), (1,2), (2,1) & (2,2). Collapse (3,1) & (3,2). Collapse (4,1) & (4,2).
Rent/housing × %Hispanic	3*5	8	5 - Drop (1,*), & (2,2).
State × Quarter	6*4	15	All levels present.
State × Age	6*5	20	All levels present.
State × Race(4 level)	6*4	15	14 - Collapse (5,3) & (5,4).
State × Hispanicity	6*2	5	All levels present.
State × Gender	6*2	5	All levels present.
State × %Black	6*3	10	3 - Drop (2,*), (3,*), (4,1), & (5,*) due to sing.
State × %Hispanic	6*3	10	3 - Drop (1,1), (3,1), (4,1), (2,*), & (5,*) due to sing.
State × %Owner-occupied	6*3	10	7 - Drop (1,3), (2,3), & (5,3).
State × Rent/housing	6*5	20	9 - Drop (1,1), (1,2), (1,3), (2,2), (2,3), (2,4), (3,1), (3,4), (4,1), & (5,*).
Three-Factor Effects			
Age × Race(3) × Hispanicity	5*3*2	8	0 - Drop all levels due to nonconv.
Age × Race(3) × Gender	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for all levels of age.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	0 - Dropped due to nonconv.
State × Age × Race(3 level)	6*5*3	40	17 - Drop (2,4,*), (3,4,*), (5,4,*). Collapse (1,1,2) & (1,1,3). Do the same for all State, age combinations.
State × Age × Hispanicity	6*5*2	20	17 - Drop (2,4,1), (5,3,1), & (5,4,1).
State × Age × Gender	6*5*2	20	All levels present.
State × Race(3 level) × Hispanicity	6*3*2	10	3 - Drop (2,*1) & (4,*1). Collapse (*,2,1) & (*,3,1).
State × Race(3 level) × Gender	6*3*2	10	5 - Collapse (1,2,1) & (3,1). Do the same for all States.
State × Hispanicity × Gender	6*2*2	5	All levels present.
Total		326	233

**Exhibit D1.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model group 1: New England**

Variables	Levels	Proposed	Final
One-Factor Effects			
	36	36	
Intercept	1	1	All levels present.
State	6	5	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hisp	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects			
		163	110
Age x Race(3)	5*3	8	6 - Drop (3,3) & (4,3).
Age x Hisp	5*2	4	All levels present.
Age x Gender	5*2	4	All levels present.
Race(3) x Hisp	3*2	2	1 - Collapse (2,1) & (3,1).
Race(3) x Gender	3*2	2	1 - Collapse (2,1) & (3,1).
Hisp x Gender	2*2	1	All levels present.
%Owner x %Black	3*3	4	All levels present.
%Owner x %Hisp	3*3	4	3 - Drop (2,1) due to sing.
%Owner x Rent/housing	3*5	8	7 - Drop (3,3) due to sing.
Rent/housing x %Black	3*5	8	2 - Drop (4,1) due to sing.
Rent/housing x %Hisp	3*5	8	Drop (1,*), (2,1), & (3,1) due to zero counts. Drop (2,2). 4 - Drop (1,*) & (2,1) due to zero counts. Drop (2,2).
State x Quarter	6*4	15	All levels present.
State x Age	6*5	20	All levels present.
State x Race(4 level)	6*4	15	8 - Drop (1,3) & (1,4). Collapse (2,3) & (2,3). Do the same for States (4) & (5). Collapse (3,2), (3,3), & (3,4). 3 - Drop (1,1) due to sing. Drop (4,1).
State x Hispanicity	6*2	5	All levels present.
State x Gender	6*2	5	All levels present.
State x %Black	6*3	10	3 - Drop (2,*), (3,*), (5,*), & (4,1) due to zero counts.
State x %Hisp	6*3	10	5 - Drop (2,*), (5,*), & (3,1) due to zero counts.
State x %Owner-occupied	6*3	10	7 - Drop (1,3), (2,3), (5,3) due to sing.
State x Rent/housing	6*5	20	7 - Drop (2,2), (3,4), (5,1), & (5,2) due to sing. Drop (1,1), (1,2), (1,3), (2,3), (2,4), (5,3), (5,4), (3,1), & (4,1) due to zero counts.
Three-Factor Effects			
		127	22
Age x Race(3) x Hisp	5*3*2	8	2 - Factor levels dropped at lower order. Collapse (1,2,1) & (1,3,1). Do the same for level (2) of age.
Age x Race(3) x Gender	5*3*2	8	1 - Factor levels dropped at lower order. Collapse (1,2,1) & (1,3,1). Drop (2,2,1), & (2,3,1) due to nonconv.
Age x Hisp x Gender	5*2*2	4	1 - Keep (1,1,1).
Race3 x Hisp x Gender	3*2*2	2	0 - Drop all levels due to nonconv.
State x Age x Race(3 level)	6*5*3	40	8 - Keep (2,1,*), (2,2,*), (4,1,*), & (4,2,*).
State x Age x Hispanicity	6*5*2	20	4 - Keep (2,1,1), (2,2,1), (4,1,1), & (4,2,1).
State x Age x Gender	6*5*2	20	6 - Keep (2,1,1), (2,2,1), (4,1,1), & (4,2,1). Collapse (3,1,1) & (5,1,1). Collapse (3,2,1) & (5,2,1).
State x Race(3 level) x Hisp	6*3*2	10	0- Drop all levels due to nonconv.
State x Race(3 level) x Gender	6*3*2	10	0- Drop all levels due to nonconv.
State x Hisp x Gender	6*2*2	5	0- Drop all levels due to nonconv.
Total		326	168

**Exhibit D1.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model group 1: New England**

Variables	Level	Proposed	Final
One-Factor Effects			
	18	18	
Intercept	1	1	All levels present.
State	6	5	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects			
	81	73	
Age x Race(3 level)	5*3	8	6 - Collapse (3,2) & (3,3). Collapse (4,2) & (4,3).
Age x Hispanicity	5*2	4	All levels present.
Age x Gender	5*2	4	All levels present.
Race(3 level) x Hisp	3*2	2	1 - Drop (3,1).
Race(3 level) x Gender	3*2	2	All levels present.
Hisp x Gender	2*2	1	All levels present.
State x Quarter	6*4	15	All levels present.
State x Age	6*5	20	All levels present.
State x Race(4 level)	6*4	15	11 - Collapse (2,3) & (2,4). Do the same for States (3), (4), & (5).
State x Hispanicity	6*2	5	4 - Drop (4,1).
State x Gender	6*2	5	All levels present.
Three-Factor Effects			
		127	54
Age x Race(3) x Hisp	5*3*2	8	2 - Factor levels dropped at lower order.
Age x Race(3) x Gender	5*3*2	8	5 - Factor levels collapsed at lower order. Drop (4,2,1), & (4,3,1).
Age x Hisp x Gender	5*2*2	4	0 - Drop (1,1,1) due to sing. Drop remainder due to nonconv.
Race3 x Hisp x Gender	3*2*2	2	0 - Factor levels dropped at lower order. Drop (2,1,1) due to nonconv.
State x Age x Race(3 level)	6*5*3	40	10 - Keep (1,1,*), (1,2,*), (2,1,*), (4,1,*), & (4,2,*).
State x Age x Hispanicity	6*5*2	20	6 - Keep (1,*), (2,2,1), & (4,1,1).
State x Age x Gender	6*5*2	20	All levels present.
State x Race(3 level) x Hisp	6*3*2	10	1 - Keep (1,2,1).
State x Race(3 level) x Gender	6*3*2	10	7 - Collapse (1,2,1) & (1,3,1). Drop (5,*), (1).
State x Hisp x Gender	6*2*2	5	3 - Drop (4,1,1) & (5,1,1).
Total	226	145	

Appendix D2

Model Group 2: Middle Atlantic

Table D2a NHSDA Person Weight GEM Modeling Summary (Model Group 2: Middle Atlantic)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	0.44%	1.04%	0.18%	1.10309	153	(1.0, 1.1)	(1.00, 1.10)
	1.10%	1.36%	0.01%	1.11499	89	(1.0, 2.0)	(1.00, 2.00)
						(1.0, 2.0)	(1.00, 2.00)
<i>res.sdu.ps</i>	1.10%	1.36%	0.01%	1.11501	124	(0.4, 1.1)	(0.40, 1.10)
	1.02%	3.21%	0.87%	1.18450	124	(0.4, 4.0)	(0.40, 4.00)
						(0.9, 4.0)	(0.90, 4.00)
<i>sel.per.ps</i>	2.62%	5.68%	2.62%	2.86577	194	(0.5, 2.0)	(0.56, 2.00)
	1.36%	4.79%	0.85%	2.75904	173	(0.5, 3.3)	(0.50, 3.30)
						(0.9, 3.3)	(0.90, 1.03)
<i>res.per.nr</i>	1.29%	4.61%	0.88%	2.79739	194	(1.0, 1.7)	(1.00, 1.70)
	1.12%	2.41%	0.20%	3.02935	161	(1.0, 2.5)	(1.00, 2.50)
						(1.0, 2.5)	(1.97, 2.11)
<i>res.per.ps</i>	1.17%	2.77%	0.26%	3.02935	124	(0.22, 1.1)	(0.22, 1.10)
	0.46%	2.26%	0.19%	3.06436	107	(0.22, 1.8)	(0.22, 1.80)
						(0.9, 1.8)	(1.00, 1.00)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum / minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

Table D2b Distribution of Weight Adjustment Factors and Weight Products (Model Group 2: Middle Atlantic)

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	273.98	0.73	282	0.38	115	117.18	0.25	59	0.55	60	0.15	14
1%	279.23	1.00	287	0.63	275	291.40	0.57	273	1.00	307	0.22	191
5%	281.94	1.02	292	0.83	313	406.87	0.75	409	1.04	468	0.74	425
10%	284.01	1.02	298	0.90	336	490.73	0.85	486	1.08	574	0.90	542
25%	372.91	1.04	406	0.98	454	706.69	0.95	708	1.16	836	0.98	820
Median	549.10	1.06	598	1.06	632	1116.06	1.02	1,172	1.25	1,423	1.02	1,435
75%	678.90	1.12	761	1.16	795	2920.37	1.08	2,951	1.40	3,570	1.04	3,796
90%	744.31	1.18	850	1.30	966	7755.50	1.17	7,771	1.60	10,370	1.13	10,376
95%	758.60	1.23	910	1.43	1,085	9706.59	1.28	9,882	1.77	14,014	1.25	13,957
99%	864.01	1.46	1,098	2.02	1,538	18363.24	1.61	17,138	2.12	24,127	1.77	24,466
Maximum	1713.55	2.02	2,086	4.66	4,253	42877.20	3.30	47,092	2.50	51,461	2.01	48,203
Max/Mean	3	1.86	4	3.40	7	16	3.24	17	16.80	14	14.30	13

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 2 Overview

Dwelling Unit Nonresponse

Group quarter level 'college dorm' was collapsed with 'other group quarters.' As a result, each State by group quarter interaction was redefined due to the hierarchical nature of the model. For New York, population densities of 'MSA less than 1,000,000' and 'Non-MSA urban' were combined with the reference cell 'Non-MSA rural' and rent/value quintiles one and two were removed. For Pennsylvania, '10-50% black', '50-100% Hispanic,' and rent/value quintiles one through four were removed.

In three-factor effects, all State by owner-occupied by rent/value, State by rent/value by percent 'black,' and State by rent/value by percent Hispanic were eliminated due to zero counts. In addition, New York '10-50% owner-occupied' by percent 'black' and percent Hispanic were removed in order to obtain convergence. In Pennsylvania, '<10% owner-occupied' by percent Hispanic was removed.

Dwelling Unit Poststratification

All proposed effects were included in the model.

(Selected) Person-Level Poststratification

Main effect group quarters combined 'college dorm' with 'other group quarter.' Among two-factor effects, the interactions of Pennsylvania with '50%-100% black,' '50%-100% Hispanic,' and rent/housing value quintiles one through four were removed due to failure of the singularity test. Rent/value quintiles one and two for New York were also removed for the same reason. Interactions of three-factor effects race by Hispanicity by State and Pennsylvania by race by age were removed.

(Respondent) Person-Level Nonresponse

All one-factor effects were included in the Middle Atlantic model. In two-factor effects, race 'other' by age 26 to 34 and 35 to 49, and age 35 to 49 by Hispanicity were removed. In two-factor State interactions, percent Hispanic, '10-50% black,' rent/value quintiles one through four for Pennsylvania and rent/value quintiles one and two for New York were removed. Most of these were due to linear combinations or zero counts. Collapses include owner-occupied levels '<10%' and '10-50%' for both Pennsylvania and New York.

To maintain the hierarchy of variables, the following three-factor effects had to be removed: race 'other' by Hispanicity and by gender for ages 26 to 34 and 35 to 49, gender by Hispanicity for age 35 to 49, race other by ages 26 to 34 and 35 to 49 for New York and Pennsylvania, and

Hispanicity by age 35 to 49 for New York and Pennsylvania. Other interactions removed were race 'black' by Hispanicity for ages 26 to 34 and 35 to 49 and State by race by Hispanicity. Finally, necessary collapsing included combining 'black' with 'other' for Hispanics age 26 to 34 and 'black' with 'other' for Hispanic crosses with gender.

(Respondent) Person-Level Poststratification

All one-factor effects were included in the model. 'Black' and 'other' were collapsed where race was crossed with Hispanicity. 'American Indian/Alaska Native' and 'Asian' samples were combined within Pennsylvania. The only adjustment required for the two-factor effects modified the reference level of age by Hispanicity to 35 or older.

The hierarchical effects of modeling carry lower order collapses of variables through to three-factor effects. As a result, gender by Hispanicity by age 35 to 49 and State by Hispanicity by age 35 to 49 were dropped. Also a result of hierarchical preservation, Hispanicity by race pooled 'black' with 'other' for both all age groups and all States. Finally, Hispanicity by age group 26 to 34 and race 'other' by age 35 to 49 for all States were eliminated from the model.

**Exhibit D2.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 2: Middle Atlantic**

Variables	Level	Proposed	Final
One-Factor Effects		21	20
Intercept	1	1	All levels present.
State	3	2	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		68	56
State × Quarter	3*4	6	All levels present.
State × Pop. Density	3*4	6	4 - Drop (2,2),(2,3).
State × Group Quarter	3*3	4	2 - Factor levels collapsed at lower order
State × %Black	3*3	4	3 - Drop (3,2).
State × %Hispanic	3*3	4	3 - Drop (3,1).
State × %Owner-occupied	3*3	4	All levels present.
State × Rent/housing	3*5	8	2 - Drop (2,1),(2,2),(3,*).
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	All levels present.
Three-Factor Effects		64	13
State × %Owner × %Black	3*3*3	8	7 - Drop (2,2,1).
State × %Owner × %Hispanic	3*3*3	8	6 - Drop (2,2,1),(3,3,1) due to nonconv.
State × %Owner × Rent/house	3*3*5	16	0 - Drop all levels due to zero counts.
State × Rent/house × %Black	3*3*5	16	0 - Drop all levels due to zero counts.
State × Rent/house × %Hispanic	3*3*5	16	0 - Drop all levels due to zero counts.
Total		153	89

**Exhibit D2.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 2: Middle Atlantic**

Variables	Level	Proposed	Final
One-Factor Effects		15	15
Intercept	1	1	All levels present.
State	3	2	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		45	45
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	3*4	6	All levels present.
State × Age	3*5	8	All levels present.
State × Race(4 level)	3*4	6	All levels present.
State × Hispanicity	3*2	2	All levels present.
State × Gender	3*2	2	All levels present.
Three-Factor Effects		64	64
Age × Race(3) × Hispanicity	5*3*2	8	All levels present.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	3*5*3	16	All levels present.
State × Age × Hispanicity	3*5*2	8	All levels present.
State × Age × Gender	3*5*2	8	All levels present.
State × Race(3 level) × Hispanicity	3*3*2	4	All levels present.
State × Race(3 level) × Gender	3*3*2	4	All levels present.
State × Hispanicity × Gender	3*2*2	2	All levels present.
Total		124	124

**Exhibit D2.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 2: Middle Atlantic**

Variables	Levels	Proposed	Final
One-Factor Effects		33	32
Intercept	1	1	All levels present.
State	3	2	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		97	89
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	3*4	6	All levels present.
State × Age	3*5	8	All levels present.
State × Race(4 level)	3*4	6	All levels present.
State × Hispanicity	3*2	2	All levels present.
State × Gender	3*2	2	All levels present.
State × %Black	3*3	4	3 - Drop (3,1) due to sing.
State × %Hispanic	3*3	4	All levels present.
State × %Owner-occupied	3*3	4	3 - Drop (3,1) due to sing.
State × Rent/housing	3*5	8	2 - Drop (2,1),(2,2),(3,*) due to sing.
Three-Factor Effects		64	52
Age × Race(3) × Hispanicity	5*3*2	8	All levels present.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	3*5*3	16	8 - Drop (3,*,*).
State × Age × Hispanicity	3*5*2	8	All levels present.
State × Age × Gender	3*5*2	8	All levels present.
State × Race(3 level) × Hispanicity	3*3*2	4	0 - Drop all levels due to nonconv.
State × Race(3 level) × Gender	3*3*2	4	All levels present.
State × Hispanicity × Gender	3*2*2	2	All levels present.
Total		194	173

**Exhibit D2.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 2: Middle Atlantic**

Variables	Levels	Proposed	Final
One-Factor Effects		33	33
Intercept	1	1	All levels present.
State	2	2	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hisp	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		97	83
Age × Race(3)	5*3	8	6 - Drop (3,3) & (4,3).
Age × Hispanicity	5*2	4	3 - Drop (4,1).
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	3*4	6	All levels present.
State × Age	3*5	8	All levels present.
State × Race(4 level)	3*4	6	All levels present.
State × Hispanicity	3*2	2	All levels present.
State × Gender	3*2	2	All levels present.
State × %Black	3*3	4	3 - Drop (3,2) due to sing.
State × %Hispanic	3*3	4	2 - Drop (3,1) due to sing. Drop (3,2).
State × %Owner-occupied	3*3	4	2 - Collapse (*,2) & (*,3).
State × Rent/housing	3*5	8	2 - Drop (2,1), (2,2), (3,*) due to sing and zero counts.
Three-Factor Effects		64	45
Age × Race(3) × Hisp	5*3*2	8	3 - Factor levels dropped at lower order. Drop (3,2,1) & (4,2,1). Collapse (2,*,1).
Age × Race(3) × Gender	5*3*2	8	6 - Factor levels dropped at lower order.
Age × Hispanicity × Gender	5*2*2	4	3 - Factor levels dropped at lower order.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Collapse (2,1,1) & (3,1,1).
State × Age × Race(3 level)	3*5*3	16	12 - Factor levels dropped at lower order.
State × Age × Hispanicity	3*5*2	8	6 - Factor levels dropped at lower order.
State × Age × Gender	3*5*2	8	All levels present.
State × Race(3 level) × Hispanicity	3*3*2	4	0 - Drop all levels.
State × Race(3 level) × Gender	3*3*2	4	All levels present.
State × Hispanicity × Gender	3*2*2	2	All levels present.
Total		194	161

**Exhibit D2.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 2: Middle Atlantic**

Variables	Level	Proposed	Final
One-Factor Effects		15	15
Intercept	1	1	All levels present.
State	3	2	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		45	42
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	3-Drop (4,1).
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	1 - Collapse (2,*) & (3,*).
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	3*4	6	All levels present.
State × Age	3*5	8	All levels present.
State × Race(4 level)	3*4	6	5 - Collapse (3,3) & (3,4).
State × Hispanicity	3*2	2	All levels present.
State × Gender	3*2	2	All levels present.
Three-Factor Effects		64	50
Age × Race(3) × Hispanicity	5*3*2	8	4 - Factor levels dropped at lower order.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	3 - Factor levels dropped at lower order.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Factor levels collapsed at lower order.
State × Age × Race(3 level)	3*5*3	16	14 - Drop (*,4,3).
State × Age × Hispanicity	3*5*2	8	4 - Factor levels dropped at lower order. Drop (*,3,1) due to nonconv.
State × Age × Gender	3*5*2	8	All levels present.
State × Race(3 level) × Hispanicity	3*3*2	4	2 - Factor levels collapsed at lower order.
State × Race(3 level) × Gender	3*3*2	4	All levels present.
State × Hispanicity × Gender	3*2*2	2	All levels present.
Total		124	107

Appendix D3

Model Group 3: East North Central

Table D3a NHSDA Person Weight GEM Modeling Summary (Model Group 3: East North Central)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	#XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	2.05%	2.37%	0.24%	1.0709	255	(1.0,1.2)	(1.04, 1.19)
	1.03%	1.11%	0.02%	1.0706	126	(1.0,1.8)	(1.00, 1.80)
						(1.0,1.8)	(1.00, 1.41)
<i>res.sdu.ps</i>	1.03%	1.11%	0.03%	1.07062	192	(0.24, 2.4)	(0.43, 2.40)
	1.28%	2.04%	0.26%	1.11988	192	(0.24, 4.1)	(0.24, 4.10)
						(0.8, 4.1)	(0.80, 3.25)
<i>sel.per.ps</i>	4.09%	7.77%	1.36%	2.64116	282	(0.4, 2.3)	(0.41, 2.30)
	1.77%	2.93%	0.44%	2.65097	231	(0.4, 3.1)	(0.40, 3.10)
						(0.7, 3.1)	(0.70, 2.97)
<i>res.per.nr</i>	2.24%	3.47%	0.54%	2.73160	282	(1.0, 2.4)	(1.00, 2.40)
	1.09%	2.56%	0.37%	2.89241	234	(1.0, 3.4)	(1.00, 3.39)
						(1.0, 3.4)	(1.00, 1.59)
<i>res.per.ps</i>	1.26%	2.78%	0.46%	2.89241	192	(0.3, 2.0)	(0.30, 1.96)
	0.86%	1.87%	0.46%	2.94229	154	(0.3, 3.3)	(0.30, 3.30)
						(0.5, 3.3)	(0.50, 2.37)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum / minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

**Table D3b Distribution of Weight Adjustment Factors and Weight Products
(Model Group 3: East North Central)**

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	45.97	0.61	161	0.24	100	100.78	0.18	50	0.57	50	0.15	56
1%	373.58	0.95	392	0.54	270	322.79	0.59	290	1.00	312	0.32	223
5%	380.74	1.02	402	0.89	389	439.31	0.77	439	1.06	528	0.90	525
10%	385.78	1.03	408	0.94	407	479.95	0.85	489	1.10	596	0.95	595
25%	401.46	1.05	437	0.97	442	590.60	0.94	602	1.19	743	0.98	745
Median	441.86	1.07	485	1.03	508	865.94	1.01	879	1.29	1,121	1.00	1,134
75%	502.59	1.09	551	1.12	602	2127.37	1.08	2,167	1.42	2,779	1.02	2,742
90%	652.45	1.13	693	1.25	759	5651.00	1.16	5,518	1.58	7,521	1.09	7,603
95%	809.84	1.19	873	1.35	957	7059.56	1.25	7,056	1.73	10,195	1.19	10,162
99%	983.01	1.36	1,047	1.72	1,272	12773.01	1.57	12,530	2.10	17,671	1.45	17,640
Maximum	1027.78	4.94	1,126	4.10	3,463	70697.21	3.51	44,346	3.39	45,854	5.32	60,129
Max/Mean	2	4.56	2	3.86	6	34	3.46	21	2.55	17	5.28	22

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 3 Overview

Dwelling Unit Nonresponse

Again, group quarters level 'college dorm' was collapsed with 'other group quarters,' but all other main effects were left intact. Among two-factor effects, State by group quarter, group quarter level 'college dorm' was collapsed with 'other group quarters' for Illinois, and interactions involving Michigan, Ohio, and Wisconsin were dropped. Ohio and Michigan by percent Hispanic level one was dropped, and percent Hispanic level one was collapsed with level two for Illinois and Wisconsin. In the State and rent/housing cross, the fourth quintile of rent/housing was collapsed with the reference cell (fifth quintile) for all States, and the third quintile was collapsed with the reference cell for Wisconsin. The second quintile of rent/housing by percent Hispanic level one was dropped.

Moving on to three-factor effects, State by percent owner-occupied by percent 'black,' percent owner-occupied '<10%' was collapsed with '10-50%' for Indiana and Wisconsin by percent 'black' levels '<10%' and '10-50%,' and for Michigan and Ohio for '<10% black.' Further, '<10% black' was collapsed with '10-50% black' for Wisconsin. For State by rent/housing by percent 'black,' the fourth quintile of rent/housing was dropped to be collapsed with the fifth quintile, and percent '<10% black' was collapsed with '10-50% black' for all States. Also, Illinois, Indiana, and Wisconsin were collapsed into one group. All Hispanic interactions, along with State by percent owner by rent/housing, were eliminated from the model due to convergence, singularities, etc.

Dwelling Unit Poststratification

All proposed effects were included in the model.

(Selected) Person-Level Poststratification

All one-factor effects were included in the model. Two-factor effects rent/housing by percent Hispanic and the second quintile of rent/housing by '<10% Hispanic' were dropped. Percent Hispanic level one was collapsed with the reference for Illinois, Michigan, and Wisconsin. Singularities removed Illinois's fourth quintile of rent housing, Ohio's first and fourth quintile, Michigan's fourth quintile, and Wisconsin's third and fourth quintiles.

In a theme common to many other model groups, the interaction of race with any two other effects was simplified by combining 'black' with 'other,' with the exception of the age, gender interaction where all levels were maintained. In addition, when crossing race, age, and State, Illinois and Wisconsin samples were pooled, as were Michigan, Ohio, and Indiana through dropping variables into the reference level. It was not possible to construct a convergent model

containing interactions between race and Hispanicity at the State level, but the remainder of higher order effects were present.

(Respondent) Person-Level Nonresponse

All main effects were included in the model. Two-factor effects were adjusted by creating a '0-50% Hispanic' variable for the second quintile of rent/housing. State specific levels of variables also combined levels of percent Hispanic to create a '0-50%' level—this was done for all States. Due to singularities or lack of sample, rent/housing value fourth quintiles in Ohio, Michigan, and Illinois were excluded (and thus combined with the reference level) and Wisconsin's third and fourth quintiles were dropped.

Following the general trend of higher order interactions involving race, 'other' was combined with 'black' in the partitioning by State and age. Also, all reference levels were redefined as 35 or older by dropping explicit interactions of age and State with the 35 to 49 age group. Once again, higher order interactions with Hispanicity required adjustment through level redefinition. At the State level, Hispanic respondents age 35 to 49 in Wisconsin and Ohio were dropped to be combined with the reference level: Indiana, age range 50 or older. State level Hispanicity variables considered by race combined 'black' and 'other' categories, and effects involving Wisconsin were excluded. Age, race interactions with Hispanicity were dropped due to convergence problems

(Respondent) Person-Level Poststratification

All main effects and two-factor effects were included in the East North Central model. The higher order interaction of age, race, and Hispanicity combined race categories 'black' and 'other' for all age categories other than 12 to 17. Race categories 'black' and 'other' were also combined when crossing race with State and age. Wisconsin was combined with Indiana, the reference level State, for this interaction as well. Hispanicity within States by age required the grouping of age into fewer categories, such that 12 to 25 and 26 to 49 ranges were created. Wisconsin specific effects were combined with reference levels.

**Exhibit D3.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 3: East North Central**

Variables	Level	Proposed	Final
One-Factor Effects		23	22
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black		3	2All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		104	87
State × Quarter	5*4	12	All levels present.
State × Pop. Density	5*4	12	All levels present.
State × Group Quarter	5*3	8	1 - Collapsed at lower order. Keep (1, *).
State × %Black	5*3	8	All levels present.
State × %Hispanic	5*3	8	4 - Drop (3,1), (5,1) due to zero counts. Collapse (1,1) & (1,2). Collapse (4,1) & (4,2)
State × %Owner-occupied	5*3	8	All levels present.
State × Rent/housing	5*5	16	11 - Collapse (4,3), (4,4), & (4,5) due to singularities Collapse (1,4) & (1,5) due to singularities, do same for all other states
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	7 - Drop (2,1) due to zero count
Three-Factor Effects		128	17
State × %Owner × %Black	5*3*3	16	11 - Collapse (1,2,1) & (1,3,1). Collapse (1,2,2) & (1,3,2). Collapse (3,1,1) & (3,1,2). Collapse (4,1,1), (4,2,1), (4,1,2), & (4,2,2) due to singularities. Collapse (5,1,1) & (5,2,1) due to singularities.
State × %Owner × %Hispanic	5*3*3	16	Drop all levels.
State × %Owner × Rent/house	5*3*5	32	Drop all levels.
State × Rent/house × %Black	5*3*5	32	6 - Keep following: Collapse (5,5,1), (5,5,2), (5,4,1) & (5,4,2). Collapse (5,3,1) & (5,3,2). Collapse (5,2,1) & (5,2,2) Collapse (3,5,1), (3,5,2), (3,4,1) & (3,4,2). Collapse (3,3,1) & (3,3,2). Collapse (3,2,1) & (3,3,2)
State × Rent/house × %Hispanic	5*3*5	32	Drop all levels.
Total		255	126

**Exhibit D3.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 3: East North Central**

Variables	Level	Proposed	Final
One-Factor Effects		17	17
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		69	69
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	All levels present.
State × Hispanicity	5*2	4	All levels present.
State × Gender	5*2	4	All levels present.
Three-Factor Effects		106	106
Age × Race(3) × Hispanicity	5*3*2	8	All levels present.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	5*5*3	32	All levels present.
State × Age × Hispanicity	5*5*2	16	All levels present.
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	All levels present.
State × Race(3 level) × Gender	5*3*2	8	All levels present.
State × Hispanicity × Gender	5*2*2	4	All levels present.
Total		192	192

**Exhibit D3.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 3: East North Central**

Variables	Levels	Proposed	Final
One-Factor Effects		35	35
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		141	131
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanicity	3*5	8	7- Drop (2,1) due to zero counts
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	All levels present.
State × Hispanicity	5*2	4	All levels present.
State × Gender	5*2	4	All levels present.
State × %Black	5*3	8	All levels present.
State × %Hispanic	5*3	8	5 - Drop (1,1), (3,1) (4,1) due to singularities
State × %Owner-occupied	5*3	8	All levels present.
State × Rent/housing	5*5	16	10 - Drop (1,4), (3,4), (4,3), (4,4), (5,1), (5,4) due to singularities
Age × Race(3) × Hispanicity	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for all age levels.
Three-Factor Effects		106	65
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Collapse (2,1,1) & (3,1,1).
State × Age × Race(3 level)	5*5*3	32	4 - Keep following: Collapse (1,1,2), (1,1,3), (4,1,2) & (4,1,3). Do for all levels of age.
State × Age × Hispanicity	5*5*2	16	All levels present.
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	Drop all
State × Race(3 level) × Gender	5*3*2	8	All levels present.
State × Hispanicity × Gender	5*2*2	4	All levels present.
Total		282	231

**Exhibit D3.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 3: East North Central**

Variables	Levels	Proposed	Final
One-Factor Effects		35	35
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		141	131
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	7 - Collapse (2,1) & (2,2) due to zero counts.
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	All levels present.
State × Hispanicity	5*2	4	All levels present.
State × Gender	5*2	4	All levels present.
State × %Black	5*3	8	All levels present.
State × %Hispanic	5*3	8	4 - Collapse (1,1) & (1,2) due to singularities. Do the same for all states.
State × %Owner-occupied	5*3	8	All levels present.
State × Rent/housing	5*5	16	11 - Drop (1,4), (3,4), (4,1), (4,2), (5,4) due to sing.
Three-Factor Effects		106	68
Age × Race(3) × Hispanicity	5*3*2	8	Drop all levels.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	5*5*3	32	12 - Drop (1,4,2). Do the same for all levels of race and state. Collapse (1,1,2) & (1,1,3). Do the same for all levels of age and state.
State × Age × Hispanicity	5*5*2	16	11 - Drop (4,1,1). Do for all levels of age. Drop (5,4,1).
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	3 - Drop (4,2,1) & (4,3,1). Collapse (1,2,1) & (1,3,1). Do the same for all states.
State × Race(3 level) × Gender	5*3*2	8	All levels present.
State × Hispanicity × Gender	5*2*2	4	All levels present.
Total		282	234

**Exhibit D3.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 3: East North Central**

Variables	Level	Proposed	Final
One-Factor Effects		17	17
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		69	69
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	All levels present.
State × Hispanicity	5*2	4	All levels present.
State × Gender	5*2	4	All levels present.
Three-Factor Effects		106	68
Age × Race(3) × Hispanicity	5*3*2	8	5 - Collapse (2,2,1) & (2,3,1). Do the same for age levels (3), (4).
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	5*5*3	32	12 - Drop (4,*,*). Collapse (1,1,2) & (1,1,3). Do the same for all levels of state.
State × Age × Hispanicity	5*5*2	16	6 - Drop (4,*,1). Collapse (1,1,1) & (1,2,1). Do the same for all states. Collapse (1,3,1) & (1,4,1). Do the same for all states.
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	3 - Drop (4,*,1). Collapse (1,2,1) & (1,3,1). Do the same for all states.
State × Race(3 level) × Gender	5*3*2	8	All levels present.
State × Hispanicity × Gender	5*2*2	4	All levels present.
Total		192	154

Appendix D4

Model Group 4: West North Central

Table D4a NHSDA Person Weight GEM Modeling Summary (Model Group 4: West North Central)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	8.14%	8.78%	0.64%	1.33269	357	(1.0,1.6)	(1.00, 1.60)
	4.83%	5.43%	0.60%	1.33892	109	(1.0,2.4)	(1.00, 2.32)
						(1.0,2.4)	(1.00, 1.68)
<i>res.sdu.ps</i>	4.83%	5.43%	0.60%	1.33892	254	(0.3, 2.0)	(0.31, 1.97)
	1.72%	2.62%	0.44%	1.40389	231	(0.3, 4.48)	(0.30, 4.48)
						(0.8, 4.48)	(0.80, 2.97)
<i>sel.per.ps</i>	4.26%	8.43%	1.43%	3.16133	370	(0.3, 2.6)	(0.30, 2.58)
	2.01%	3.98%	0.88%	3.41693	247	(0.3, 4.4)	(0.30, 4.36)
						(0.6, 4.4)	(0.60, 4.40)
<i>res.per.nr</i>	2.28%	4.50%	0.95%	3.48578	370	(1.0, 2.7)	(1.00, 2.70)
	1.77%	4.05%	0.99%	3.67962	222	(1.0, 4.0)	(1.00, 4.00)
						(1.0, 4.0)	(1.00, 2.04)
<i>res.per.ps</i>	1.85%	4.38%	1.12%	3.67962	260	(0.3, 3.2)	(0.43, 3.20)
	1.15%	3.28%	1.16%	3.76167	171	(0.3, 4.5)	(0.22, 3.30)
						(0.5, 4.5)	(0.77, 3.21)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.³ Number of proposed covariates on top line, and number finalized after modeling.⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum / minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

**Table D4b Distribution of Weight Adjustment Factors and Weight Products
(Model Group 4: West North Central)**

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	111.09	0.84	113	0.30	39	47.87	0.16	18	0.50	17.87	0.26	10
1%	113.67	0.94	119	0.40	105	122.25	0.31	82	1.00	84.75	0.31	67
5%	131.51	1.00	137	0.77	124	162.03	0.55	148	1.00	175.73	0.78	169
10%	135.51	1.01	142	0.84	143	191.70	0.73	185	1.04	220.46	0.89	219
25%	167.55	1.04	177	0.98	197	403.29	0.89	369	1.12	435.46	0.97	432
Median	431.92	1.06	454	1.08	51	924.89	1.02	905	1.22	1112.57	1.00	1,113
75%	687.28	1.09	741	1.21	804	1798.88	1.14	1,808	1.36	2300.27	1.04	2,318
90%	817.86	1.12	884	1.36	998	4893.13	1.26	5,020	1.58	6416.32	1.11	6,351
95%	848.33	1.15	935	1.49	1,119	8599.98	1.38	8,959	1.82	10946.73	1.24	10,821
99%	1033.81	1.28	1,139	1.83	1,408	13477.38	2.11	14,776	2.82	20465.92	2.93	21,642
Maximum	1359.30	2.32	1,166	4.48	5,129	32529.36	5.48	42,584	4.00	60173.62	5.95	69,154
Max/Mean	3	2.18	2	4.07	9	17	5.37	22	3.09	24	5.75	28

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 4 Overview

Dwelling Unit Nonresponse

All the one-factor effects were included in this model. Interactions involving State and population density were simplified by collapsing 'MSA 1,000,000 or more' with 'MSA less than 1,000,000' for Iowa, North Dakota, Nebraska, and South Dakota. Also the '50-100%' level of owner-occupied' was collapsed with the '10-50%' level for Minnesota. Group quarters level 'college dorm' was collapsed with 'other group quarters,' and then Iowa, North Dakota, South Dakota, and Minnesota were combined. '<10% black' was collapsed with '10-50% black' for all States except Kansas, Iowa was collapsed with Minnesota, and North Dakota with South Dakota. A '0-50% Hispanic' was created, then Iowa, North Dakota, South Dakota and Minnesota were collapsed into one group and Kansas and Nebraska into another. Within two-factor interactions involving non-State effects, percent 'black' levels '<10%' and '10-50%' were combined for: '50-100% owner-occupied' and the third quintile of the rent/housing variable. A '0-50%' level of percent Hispanic was created for all levels of percent owner-occupied and rent/housing, and the fourth quintile of rent/housing was also collapsed with the reference cell (fifth quintile). No three-factor effects were included in the model.

Dwelling Unit Poststratification

All one-factor variables were included in the model. All two-factor effects were present except that race level 'Asian' was collapsed with 'American Indian/Alaska Native' for the state of Minnesota. Moving on to three-factor effects, the interaction of age, race, and Hispanicity's reference level was redefined as 26 or older. In addition, the 12 to 17 and 18 to 25 age ranges had race level 'other' collapsed with 'black'. For State by age by race, the race level 'other' was collapsed with 'black' for South Dakota and North Dakota. For State by race by gender, the race level 'other' was collapsed with 'black' for South Dakota. State by race by Hispanicity was dropped completely.

(Selected) Person-Level Poststratification

None of the main effects were compromised. Singularities removed '<10% Hispanic' by both '10-50%' and '50-100%' owner-occupied, the second through fourth quintiles of rent/housing in Iowa, Minnesota, North Dakota, South Dakota, Kansas, and Nebraska. Also due to singularities, '<10% black' was dropped for Iowa, Minnesota, North Dakota, Nebraska, and South Dakota. '10-50% Hispanic' was dropped for Iowa, Minnesota, North Dakota, and South Dakota. '50-100% owner-occupied' was dropped for South Dakota. The first quintile of rent/housing was excluded for Minnesota, the second for South Dakota and Minnesota, the third for South Dakota,

Iowa, and Minnesota, and the fourth was combined with the reference level for South Dakota, Iowa, Minnesota, and Nebraska.

Higher order effects were greatly reduced due to singularities and convergence problems. 'Black' Hispanic males were combined with the reference level in the race, Hispanicity, gender interaction. Iowa, Minnesota, and North and South Dakota samples of 'black' and 'other' race respondents were all pooled into one category for the State, race interaction with Hispanicity. Kansas and Nebraska 'black' and 'other' respondents were also combined in the same manner. Lack of respondents led to the combining North Dakota 'black' males with those of the reference State Missouri. Three factor interactions involving age, race, and Hispanicity; State, age, and race; and State, age, and gender were removed from the model due to convergence problems.

(Respondent) Person-Level Nonresponse

The West North Central model group kept all main effects. In two-factor interactions, race by Hispanicity combined 'Asian' with 'blacks.' The cross of segment level characteristics percent owner-occupied and percent Hispanic supported only a '0-50%' Hispanic range as opposed to the initial '<10%' and '10-50%' ranges. Rent/housing value quintiles were collapsed where interactions with percent Hispanic yielded too few respondents: for the '<10% of segment Hispanic' rent/housing value breakdowns, the first and second quintiles were combined, the third had no representation, and the fourth was insufficient alone, so it was combined with the equivalent '10-50% Hispanic' level.

State specific versions of many effects were proposed, but sampling produced limited numbers of North and South Dakota black respondents, so the domains were pooled. Hispanic respondents in North and South Dakota were also combined, as were Hispanics in Nebraska and Kansas.

In all states other than Kansas the '<10%' and '10-50%' segments percent 'black' were too specific so '0-50%' was used. Once again the resulting North and South Dakota samples were consolidated. Segment level consideration of percent Hispanic was lost in Iowa, Minnesota, and North and South Dakota, and the less fine '0-50%' range was applied in Kansas and Nebraska. South Dakota's '50-100% owner-occupied' was lost due to singularity, but all other interactions between State and this effect were controlled for. Original proposed levels of State rent/housing value quintiles were compromised by mixing sample from Iowa with Minnesota, and North and South Dakota. Singularity removed the fourth quintile of Nebraska's rent/housing value.

Moving on to higher order effects, the reference level of age was broadened to 26 or older for the age, race, gender interaction, and to 35 or older where interacting with Hispanicity and gender. Gender by race in the States of Iowa, Minnesota, and South Dakota combined 'other' with 'black.'

No three-factor interactions with Hispanicity were kept in the model due to convergence problems.

(Respondent) Person-Level Poststratification

All one-factor variables were included in the model but among two-factor effects, State by race, combined 'American Indian/Alaska Native' with 'Asian' in Iowa. All higher order State interactions with race combined the 'other' and 'black' categories. State by race by gender was one of the effects affected by this change, but was otherwise unchanged. In addition, the State level age by race grouping pooled samples across Iowa and Minnesota, and North Dakota with South Dakota. For all of these effects, age was redefined with 26 or older reference level. Similarly, the State level Hispanicity grouping of the redefined race pooled State samples Iowa with Minnesota, North Dakota with South Dakota, and Kansas and Nebraska with Missouri. In the cases of race by age and Hispanicity, and State by age and Hispanicity, convergence problems led to the complete removal of these effects from the model.

**Exhibit D4.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 4: West North Central**

Variables	Level	Proposed	Final
One-Factor Effects		25	25
Intercept	1	1	All levels present.
State	7	6	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		140	84
State × Quarter	7*4	18	All levels present.
State × Pop. Density	7*4	18	14- Collapse (1,1) & (1,2) due to zero counts. Collapse (5,1) & (5,2) due to zero counts. Collapse (6,1) & (6,2) due to zero counts. Collapse (7,1) & (7,2) due to zero counts.
State × Group Quarter	7*3	12	3 - Collapse (1,1) & (1,2) due to zero counts. Do the same for states (3), (4), & (7)
State × %Black	7*3	12	5 - Collapse (1,1), (1,2), (3,1) & (3,2) due to zero counts. Collapse (6,1), (6,2), (7,1) & (7,2) due to zero counts. Collapse (5,1) & (5,2) due to singularities.
State × %Hispanic	7*3	12	2 - Collapse (1,1), (1,2), (3,1), (3,2), (6,1), (6,2), (7,1), & (7,2) due to zero counts. Collapse (2,1), (2,2), (5,1) & (5,2) due to zero counts.
State × %Owner-occupied	7*3	12	11 - Collapse (3,2) & (3,3) due to zero counts.
State × Rent/housing	7*5	24	8 - Collapse (1,1), (3,1), (6,1) & (7,1) due to zero counts. Do the same for all levels of rent/housing. Collapse (2,1), (5,1) due to zero counts. Do the same for all levels of rent/housing.
%Owner × %Black	3*3	4	3 - Collapse (3,2) & (3,3) due to zero counts.
%Owner × %Hispanic	3*3	4	2 - Collapse (2,1) & (2,2) due to zero counts. Collapse (1,1) & (1,2) due to zero counts.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	7 - Collapse (3,1) & (3,2) due to zero counts.
Rent/housing × %Hispanic	3*5	8	3 - Drop Rent/housing (4) due to zero counts. Collapse (1,1) & (1,2) due to zero counts. Do the same for all levels of rent/housing.
Three-Factor Effects		192	0
State × %Owner × %Black	7*3*3	24	Drop all levels.
State × %Owner × %Hispanic	7*3*3	24	Drop all levels.
State × %Owner × Rent/house	7*3*5	48	Drop all levels.
State × Rent/house × %Black	7*3*5	48	Drop all levels.
State × Rent/house × %Hispanic	7*3*5	48	Drop all levels.
Total		357	109

**Exhibit D4.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 4: West North Central**

Variables	Level	Proposed	Final
One-Factor Effects		19	19
Intercept	1	1	All levels present.
State	7	6	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		93	92
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	7*4	18	All levels present.
State × Age	7*5	24	All levels present.
State × Race(4 level)	7*4	18	17 - Collapse (3,3) & (3,4).
State × Hispanicity	7*2	6	All levels present.
State × Gender	7*2	6	All levels present.
Three-Factor Effects		142	121
Age × Race(3) × Hispanicity	5*3*2	8	2- Keep following: Collapse (1,2,1) & (1,3,1). Do the same over all ages. Collapse (1,2,2) & (1,3,2). Do the same over all ages.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	7*5*3	48	40- Collapse (6,1,2) & (6,1,3). Do the same for all levels of age. Do the same for state (7).
State × Age × Hispanicity	7*5*2	24	All levels present.
State × Age × Gender	7*5*2	24	All levels present.
State × Race(3 level) × Hispanicity	7*3*2	12	Drop All
State × Race(3 level) × Gender	7*3*2	12	11- Collapse (6,2,1) & (6,3,1).
State × Hispanicity × Gender	7*2*2	6	All levels present.
Total		254	232

**Exhibit D4.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 4: West North Central**

Variables	Levels	Proposed	Final
One-Factor Effects		37	37
Intercept	1	1	All levels present.
State	7	6	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		185	154
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	2 - Drop (2,1), (3,1) due to singularities.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	5 - Drop (2,1), (3,1), (4,1) due to singularities
State × Quarter	7*4	18	All levels present.
State × Age	7*5	24	All levels present.
State × Race(4 level)	7*4	18	All levels present.
State × Hispanicity	7*2	6	All levels present.
State × Gender	7*2	6	All levels present.
State × %Black	7*3	12	7 - Drop (1,1), (3,1), (5,1), (6,1), (7,1) due to the singularities.
State × %Hispanic	7*3	12	2 - Keep (2,2), (5,2)
State × %Owner-occupied	7*3	12	11 - Drop (6,3) due to singularities
State × Rent/housing	7*5	24	14 - Drop (1,3), (1,4), (3,1), (3,2), (3,3), (3,4), (5,4), (6,2), (6,3), & (6,4) due to singularities.
Three-Factor Effects		148	56
Age × Race(3) × Hispanicity	5*3*2	8	Drop All
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Drop (2,1,1) due to singularities.
State × Age × Race(3 level)	7*5*3	48	Drop All
State × Age × Hispanicity	7*5*2	24	Drop All
State × Age × Gender	7*5*2	24	All levels present.
State × Race(3 level) × Hispanicity	7*3*2	12	2 - Collapse (1,2,1), (1,3,1), (3,2,1), (3,3,1), (6,2,1), (6,3,1), (7,2,1), & (7,3,1). Collapse (2,2,1), (2,3,1), (5,2,1), & (5,3,1)
State × Race(3 level) × Gender	7*3*2	12	11 - Drop (7,2,1) due to singularities.
State × Hispanicity × Gender	7*2*2	6	All levels present.
Total		370	247

**Exhibit D4.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 4: West North Central**

Variables	Levels	Proposed	Final
One-Factor Effects		37	37
Intercept	1	1	All levels present.
State	7	6	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		185	145
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1)
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	2 - Collapse (2,1) & (2,2) due to singularities. Collapse (3,1) & (3,2) due to singularities.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	4 - Drop (3,1) due to singularities. Collapse (1,1) & (2,1), (1,2) & (2,2). Collapse (4,1) & (4,2).
State × Quarter	7*4	18	All levels present.
State × Age	7*5	24	All levels present.
State × Race(4 level)	7*4	18	17 - Collapse (6,2) & (7,2)
State × Hispanicity	7*2	6	4 - Collapse (2,1) & (5,1). Collapse (6,1) & (7,1).
State × Gender	7*2	6	All levels present.
State × %Black	7*3	12	6 - Collapse (6,1), (6,2), (7,1), (7,2). Collapse (1,1) & (1,2). Do the same for states (3), (5), (6), (7).
State × %Hispanicity	7*3	12	2 - Keep following : Collapse (2,1) & (2,2). Collapse (5,1) & (5,2).
State × %Owner-occupied	7*3	12	11 - Drop (6,3) due to singularities.
State × Rent/housing	7*5	24	11 - Collapse (1,1), (3,1), (6,1), & (7,1) due to zero counts. Drop (5,4) due to singularities.
Three-Factor Effects		148	40
Age × Race(3) × Hispanicity	5*3*2	4	Drop all levels.
Age × Race(3) × Gender	5*3*2	8	4 - Drop (3,2,1), (4,2,1), (3,3,1), & (4,3,1).
Age × Hispanicity × Gender	5*2*2	4	3 - Drop (4,1,1)
Race3 × Hispanicity × Gender	3*2*2	2	Drop all levels.
State × Age × Race(3 level)	7*5*3	48	Drop all levels.
State × Age × Hispanicity	7*5*2	24	Drop all levels.
State × Age × Gender	7*5*2	24	All levels present.
State × Race(3 level) × Hispanicity	7*3*2	12	Drop all levels.
State × Race(3 level) × Gender	7*3*2	12	9 - Collapse (1,2) & (1,3). Do the same for states (3), (6).
State × Hispanicity × Gender	7*2*2	6	Drop all levels.
Total		370	222

**Exhibit D4.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 4: West North Central**

Variables	Level	Proposed	Final
One-Factor Effects		19	19
Intercept	1	1	All levels present.
State	7	6	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		93	92
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	7*4	18	All levels present.
State × Age	7*5	24	All levels present.
State × Race(4 level)	7*4	18	17 - Collapse (1,3) & (1,4)
State × Hispanicity	7*2	6	All levels present.
State × Gender	7*2	6	All levels present.
Three-Factor Effects		148	60
Age × Race(3) × Hispanicity	5*3*2	8	Drop all levels.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	7*5*3	48	8 - Drop (1,3,1), (1,4,1). Do the same for all states. Collapse (1,1,2) & (1,1,3). Do the same for all levels of age. Collapse (6,1,2) & (7,1,3) due to singularities. Do the same for all levels of age.
State × Age × Hispanicity	7*5*2	24	Drop all levels.
State × Age × Gender	7*5*2	24	All levels present.
State × Race(3 level) × Hispanicity	7*3*2	12	2 - Keep following: Collapse (1,2,1), (1,3,1), (3,2,1) & (3,3,1). Collapse (6,2,1), (6,3,1), (7,2,1) & (7,3,1) due to singularities.
State × Race(3 level) × Gender	7*3*2	12	6 - Collapse (1,2,1) & (1,3,1). Do same for all states.
State × Hispanicity × Gender	7*2*2	6	All levels present.
Total		260	171

Appendix D5

Model Group 5: South Atlantic

Table D5a NHSDA Person Weight GEM Modeling Summary (Model Group 5: South Atlantic)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	4.86%	7.55%	0.85%	1.32143	459	(1.0, 1.4)	(1.00, 1.40)
	2.99%	5.31%	0.43%	1.32402	195	(1.0, 1.5)	(1.00, 1.50)
						(1.0, 1.5)	(1.00, 1.22)
<i>res.sdu.ps</i>	2.99%	5.31%	0.43%	1.32402	328	(0.3, 1.4)	(0.30, 1.40)
	1.61%	3.59%	0.48%	1.36772	267	(0.3, 3.4)	(0.30, 3.40)
						(0.9, 3.4)	(0.90, 3.35)
<i>sel.per.ps</i>	2.97%	7.52%	1.56%	3.65063	458	(0.5, 1.5)	(0.50, 1.50)
	1.35%	2.16%	0.27%	3.45289	350	(0.5, 3.5)	(0.50, 3.47)
						(0.9, 3.5)	(0.90, 3.49)
<i>res.per.nr</i>	1.24%	1.81%	0.21%	3.51653	458	(1.0, 1.9)	(1.00, 1.90)
	1.41%	3.17%	0.30%	3.92944	330	(1.0, 3.0)	(1.00, 2.98)
						(1.0, 3.0)	(1.00, 2.47)
<i>res.per.ps</i>	1.41%	3.51%	0.48%	3.92944	328	(0.3, 1.4)	(0.30, 1.40)
	0.56%	0.71%	0.09%	3.93268	247	(0.3, 3.7)	(0.30, 3.70)
						(0.9, 3.7)	(0.90, 3.70)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum / minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

**Table D5b Distribution of Weight Adjustment Factors and Weight Products
(Model Group 5: South Atlantic)**

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	34	0.73	34	0.22	11	34	0.25	18	0.53	18	0.18	7
1%	35	0.92	35	0.34	29	59	0.52	58	1.00	64	0.31	60
5%	74	1.00	76	0.65	73	142	0.72	142	1.02	160	0.63	153
10%	100	1.01	106	0.81	110	247	0.80	253	1.03	295	0.92	257
25%	367	1.03	382	0.94	338	666	0.91	658	1.11	722	0.97	726
Median	674	1.05	700	1.05	724	1,102	1.01	1,116	1.20	1,321	1.01	1,335
75%	756	1.08	832	1.20	924	2,587	1.12	2,589	1.35	3,026	1.05	3,039
90%	988	1.13	1,022	1.36	1,162	8,213	1.24	8,513	1.54	10,383	1.13	10,380
95%	1,096	1.19	1,135	1.50	1,380	13,111	1.36	12,976	1.70	17,125	1.23	17,005
99%	1,497	1.37	1,676	1.98	1,869	23,382	1.82	22,062	2.17	30,459	1.65	30,457
Maximum	2,583	6.69	2,672	4.02	3,366	57,519	4.32	38,150	4.43	68,755	7.75	63,062
Max/Mean	4	6.26	4	3.74	5	20	4.21	13	3.52	19	7.67	17

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 5 Overview

Dwelling Unit Nonresponse

All the one-factor effects were included in the final model for the South Atlantic States. All the proposed non-State two-factor effects remained in the model intact except for two crosses of the rent/housing value, both of which were redefined due to zero or low counts in its interaction with segment-level percentage of Hispanics. Of all the State interactions, only Washington D.C. had sufficient sample and no exact linear combinations in its crosses with segment-level percentage of Hispanics and 'black.' Delaware and Maryland group quarters counts were combined, and Florida's 'college dorm' and 'non-dorm group quarters' counts were combined. For the remainder, low counts and convergence problems led to the removal of group quarters interactions from the model. Singularities and exact linear combinations led to the removal of population density measure variables from crosses with Washington D.C., Delaware, and West Virginia. In addition, the urban non-MSA level of population density for Delaware and Maryland was combined to fortify small counts. Singularities, exact linear combinations, prior collapses, and low counts removed the vast majority of three-factor effects.

Dwelling Unit Poststratification

All proposed one-factor effects were fit into the final model. The 'American Indian/Alaska Native' and 'Asian' categories were combined in the interaction between race and State for Delaware. Also, the State by Hispanicity cross was removed for North and South Carolina, Virginia, and West Virginia due to low counts. However, all other State and non-State two-factor effects were included in the model. All three-factor effects except for those crossing State by Hispanicity were included. All levels of State by Hispanicity were removed from the model due to nonconvergence.

(Selected) Person-Level Poststratification

All the proposed one-factor effects were included in the final model. The lower two quintiles of rent/housing were combined in the cross with the second level of segment level percent Hispanic, but the first quintile by first level percent Hispanic was lost due to singularity. In the race by State interaction, all States except Delaware combined 'American Indian/Alaska Native' and 'Asian' groups. Most States had zero respondents in the first level of the percent Hispanic category and thus were excluded from the model. Florida lost the first level of percent 'black' due to a singularity in the cross, but all other effects were kept. Virginia and West Virginia combined the first level of percent owner-occupied dwelling units. Many levels of the State level rent/housing variable were removed due to either zero respondents or exact linear combinations. Among the remaining effects of that type, North Carolina combined its levels one

and two with level one of Virginia. The remaining effects of this type were kept in the model. The age, race, and Hispanicity combination was reduced by combining the 'black' and 'other' categories, and redefining age to 26 or older. Age, race, and gender remained in the model intact except that 'black' and 'other' were combined for the 35 to 49 age group. All levels of the age, Hispanicity, and gender effect were maintained. Once again the 'black' and 'other' categories were combined, this time for the race, Hispanicity, and gender effect. Of the State three-factor effects, only the age, gender cross was maintained in full. Delaware utilized the above mentioned race redefinition in the State, race, gender effect. Both North Carolina and West Virginia Hispanicity by gender effects had to be removed to achieve a convergent model. Only the first three levels of age by Hispanicity in North Carolina were kept in the model; the rest had to be removed for convergence or zero sample. Several States combined 'black' and 'other' for the age interaction, and as a result about two-thirds of the effects in this interaction were maintained. Similarly, race was combined for the race, Hispanicity, State interaction, but after removal of singularities and factors leading to nonconvergence only about half were retained.

(Respondent) Person-Level Nonresponse

All the proposed one-factor effects are included in the model. For the two-factor effect of State and race, 'American Indian/Alaska Native' and 'Asian' were combined for every State. The first quintile of rent/housing and the first level of percent Hispanic were the only loss in the two factor cross of these variables. 'Black' and 'other' were combined within each State. Nearly all of the '<10% Hispanic' State combination were removed, and for South Carolina and Florida, the effect was fully removed. The State interaction with percent 'black' was complete except for the removal of the first level interaction with Florida. A large number of the State by rent/housing effects were removed due to zero counts and exact linear combinations. Among the three-factor effects, State by race by gender, State by age by gender, and age by Hispanicity by gender, were kept in their entirety. North and South Carolina and Virginia were combined for their Hispanicity gender cross. State, race, and Hispanicity were completely removed since inclusion of any of these effects yielded a nonconvergent model. Florida was the only State capable of supporting the age, Hispanicity effect and kept all age groups. When crossing age, race, and gender, 'black' was combined with 'other' for each age category. Within age by race and Hispanicity, race was treated in a similar manner, but age 35 or older was created by combining the age 35 to 49, and 50 or older categories. 'Black' and 'other' were also collapsed together in the State by age by race interactions. In addition, an age 18 to 34 category was created for Washington D.C., and Virginia and West Virginia now share a 35 to 49 age race category.

(Respondent) Person-Level Poststratification

No collapsing was required for main effects. 'American Indian/Alaska Native' and 'Asian' were combined in the race Hispanicity interaction, and in the State race interaction for all States. No

other compromise was required for the two-factor effects. The hierarchical carry-through of the collapsing of race in the race Hispanicity interaction to the three-factors compresses all effects containing race and Hispanicity to half their original number. Likewise, all other three-factor effects combined 'black' and 'other,' which halves all other three-factor effects. Outside of this change, the age, race, Hispanicity interaction also combined age groups to create a 34 or older reference level.

**Exhibit D5.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 5: South Atlantic**

Variables	Level	Proposed	Final
One-Factor Effects		27	27
Intercept	1	1	All levels present.
State	9	8	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		176	120
State × Quarter	9*4	24	All levels present.
State × Pop. Density	9*4	24	18 - Collapse (1,3) & (4,3). Drop (2,1) due to sing. Drop (1,1), (2,2), (2,3), & (8,1) due to zero counts.
State × Group Quarter	9*3	16	5 - Collapse (1,1), (1,2), (5,1) & (5,2). Do the same for States (6), (7), & (8). Drop remainder due to zero counts./ sing.
State × %Black	9*3	16	14 - Drop (8,1) & (9,1) due to sing.
State × %Hispanic	9*3	16	6 - Drop (1,1), (3,1), (5,1), (6,1), (7,*), (8,*), & (9,*) due to zero counts./exact lin. comb.
State × %Owner-occupied	9*3	16	12 - Collapse (6,3) & (7,3). Drop (7,2) due to convergence problems. Drop (8,1) & (9,1) due to exact lin. comb.
State × Rent/housing	9*5	32	11 - Collapse (1,1) & (5,1). Do the same for levels (2) & (3) of Rent/housing. Collapse (6,1) & (8,1). Collapse (6,2) & (8,2). Keep (1,2), (1,3), (1,4), (2,4), (3,1), (3,2), (3,3), (5,4), & (7,1). Drop remainder due to exact lin. comb.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	5*3	8	8All levels present.
Rent/housing × %Hispanic	3*5	8	6 - Collapse (1,2) & (2,2). Drop (1,1) due to zero counts.
Three-Factor Effects		256	48
State × %Owner × %Black	9*3*3	32	18 - Collapse (2,3,1) & (4,3,1). Collapse (1,3,2), (2,3,2), & (4,3,2). Drop (1,3,2), (5,3,2), (6,3,2), & (9,3,2) due to nonconv. Drop (5,3,1), (6,3,1), (8,2,*), & (8,3,2) due to zero counts. Drop (7,3,2) & (8,3,1) due to exact. lin. comb.
State × %Owner × %Hispanic	9*3*3	32	7 - Keep (1,2,2), (5,2,2), (7,*2), & (9,*2). Collapse (2,2,2), (2,3,2), (4,2,2) & (4,3,2). Drop (4,3,1), (6,3,2), (7,2,1), & (9,*1) due to sing. Drop remainder due to zero counts.
State × %Owner × Rent/house	9 3*5	64	11 - Keep (1,2,3), (2,3,4), (4,2,4), (4,3,4), (6,2,*), (9,3,3), & (9,2,*). Collapse (5,2,1) & (5,3,1). Collapse (9,3,1) & (9,3,2). Drop (4,3,2) & (6,3,1) due to higher order collapses. Drop (1,*2), (1,*4), (2,2,4), (5,*2), (5,2,4), (6,3,2), (7,*3), (7,*4), (8,*1) & (9,*4) due to sing. Drop remainder due to zero counts.
State × Rent/house × %Black	9*3*5	64	11 - Keep (1,2,2), (1,3,2), (1,4,*), (2,4,1), (4,4,2), (5,1,*), & (6,1,*). Collapse (9,2,1), (9,2,2), (9,3,1) & (9,3,2). Drop (1,3,1), (4,2,1), (5,2,*), (5,4,2), (6,2,*), (7,1,2), (7,3,2), (7,4,*), (8,1,*), (9,1,2), (9,3,1), & (9,4,*) due to sing. Drop remainder due to zero counts.
State × Rent/house × %Hispanic	9*3*5	64	1 - Keep (9,2,2). Drop (1,4,2), (5,2,2), (6,1,2), (7,3,2), (9,1,2), (9,3,2), & (9,4,*) due to sing. Drop remainder due to zero counts.
Total		459	195

**Exhibit D5.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 5 South Atlantic**

Variables	Level	Proposed	Final
One-Factor Effects		21	21
Intercept	1	1	All levels present.
State	9	8	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		117	112
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	9*4	24	All levels present.
State × Age	9*5	32	All levels present.
State × Race(4 level)	9*4	24	23 - Collapse (1,3) & (1,4).
State × Hispanicity	9*2	8	4 - Drop (5,1). Do the same for states (6), (7), & (8).
State × Gender	9*2	8	All levels present.
Three-Factor Effects		190	134
Age × Race(3) × Hispanicity	5*3*2	8	All levels present.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	9*5*3	64	All levels present.
State × Age × Hispanicity	9*5*2	32	0 - Drop all due to nonconv.
State × Age × Gender	9*5*2	32	All levels present.
State × Race(3 level) × Hispanicity	9*3*2	16	0 - Drop all due to nonconv.
State × Race(3 level) × Gender	9*3*2	16	All levels present.
State × Hispanicity × Gender	9*2*2	8	0 - Drop all due to nonconv.
Total		328	267

**Exhibit D5.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 5: South Atlantic**

Variables	Levels	Proposed	Final
One-Factor Effects		39	39
Intercept	1	1	All levels present.
State	9	8	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		229	187
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	6 - Collapse (1,2) & (2,2). Drop (1,1) due to zero counts.
State × Quarter	9*4	24	All levels present.
State × Age	9*5	32	All levels present.
State × Race(4 level)	9*4	24	15 - Collapse Race levels (3) & (4) for all states but (1).
State × Hispanicity	9*2	8	All levels present.
State × Gender	9*2	8	All levels present.
State × %Black	9*3	16	15 - Drop (8,1) due to zero counts.
State × %Hispanic	9*3	16	7 - Drop (1,1), (4,1), (5,1), (6,*), (7,1), & (8,*) due to zero counts. Drop (9,1) due to exact lin. comb.
State × %Owner-occupied	9*3	16	15 - Collapse (7,1) & (8,1).
State × Rent/housing	9*5	32	12 - Drop (5,4), (6,2), (8,1), & (9,1) due to exact lin. comb. Collapse (6,1), (6,2), & (7,1). Drop remainder due to zero counts.
Three-Factor Effects		190	122
Age × Race(3) × Hispanicity	5*3*2	8	2 - Collapse (1,2,1) & (1,3,1). Collapse (2,2,1) & (2,3,1). Drop (4,3,3) due to exact lin comb. Drop remainder due to nonconv.
Age × Race(3) × Gender	5*3*2	8	7 - Collapse (4,2,1) & (4,3,1).
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Collapse (2,1,1) & (3,1,1).
State × Age × Race(3 level)	9*5*3	64	44 - Collapse (1,1,2) & (1,1,3). Do the same for each age group in states (2), (6), (8), & (9).
State × Age × Hispanicity	9*5*2	32	3 - Keep (6,1,1), (6,2,1), & (6,3,1). Drop (6,4,1) due to exact lin. comb. Drop (9,3,1) & (9,4,1) due to zero counts. Drop remainder due to nonconv.
State × Age × Gender	9*5*2	32	All levels present.
State × Race(3 level) × Hispanicity	9*3*2	16	8 - Collapse (1,2,1) & (1,3,1). Do the same for states (2) & (7). Drop (6,3,1) & (8,2,1) due to zero counts. Drop (5,*,1), (9,3,1) due to nonconv.
State × Race(3 level) × Gender	9*3*2	16	15 - Collapse (1,2,1) & (1,3,1).
State × Hispanicity × Gender	9*2*2	8	6 - Drop (6,1,1) & (8,1,1) due to nonconv.
Total		458	350

**Exhibit D5.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 5: South Atlantic**

Variables	Levels	Proposed	Final
One-Factor Effects		39	39
Intercept	1	1	All levels present.
State	9	8	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		229	188
Age × Race(3)	5*3	8	4 - Collapse (1,2) & (1,3). Do the same for all levels of Age.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	7 - Drop (1,1) due to zero counts.
State × Quarter	9*4	24	All levels present.
State × Age	9*5	32	All levels present.
State × Race(4 level)	9*4	24	16 - Collapse (1,3) & (1,4). Do the same for every state.
State × Hispanicity	9*2	8	All levels present.
State × Gender	9*2	8	All levels present.
State × %Black	9*3	16	15 - Drop (9,1) due to zero counts.
State × %Hispanic	9*3	16	7 - Drop (2,1), (5,1), (6,1), (7,*), & (9,*) due to zero counts. Drop (3,1) & (8,1) due to sing.
State × %Owner-occupied	9*3	16	All levels present.
State × Rent/housing	9*5	32	14 - Drop (1,1), (1,2), (1,3), (2,1), (5,3), (6,3), (7,3), (7,4), (8,2), (9,2), (9,3), & (9,4) due to zero counts. Drop (3,1), (6,4), (7,2), (8,3), (8,4), & (9,1) due to sing.
Three-Factor Effects		190	100
Age × Race(3) × Hispanicity	5*3*2	8	3 - Collapse (1,2,1) & (1,3,1). Do the same for each level of Age. Drop (4,*,1) to collapse with reference.
Age × Race(3) × Gender	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for each level of Age.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Collapse (2,1,1) & (3,1,1).
State × Age × Race(3 level)	9*5*3	64	30 - Collapse (1,1,2) & (1,1,3). Do the same for each State × Age combination. Collapse (2,3,2), (2,3,3), (2,4,2) & (2,4,3). Collapse (7,4,2), (7,4,3), (8,4,2) & (8,4,3).
State × Age × Hispanicity	9*5*2	32	4 - Keep (3,*,1). Drop (9,3,1) & (9,4,1) due to zero counts. Drop (6,4,1) due to sing. Drop remainder due to nonconv.
State × Age × Gender	9*5*2	32	All levels present.
State × Race(3 level) × Hispanicity	9*3*2	16	0 - Drop (6,3,1) & (8,2,1) due to zero counts. Drop remainder due to nonconv.
State × Race(3 level) × Gender	9*3*2	16	All levels present.
State × Hispanicity × Gender	9*2*2	8	6 - Collapse (6,1,1), (7,1,1), & (8,1,1).
Total		458	330

**Exhibit D5.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 5: South Atlantic**

Variables	Level	Proposed	Final
One-Factor Effects		21	21
Intercept	1	1	All levels present.
State	9	8	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		117	108
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1).
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	9*4	24	All levels present.
State × Age	9*5	32	All levels present.
State × Race(4 level)	9*4	24	16 - Collapse (1,3) & (1,4). Do the same for each state.
State × Hispanicity	9*2	8	All levels present.
State × Gender	9*2	8	All levels present.
Three-Factor Effects		190	118
Age × Race(3) × Hispanicity	5*3*2	8	2 - Collapse (1,2,1) & (1,3,1). Do the same for age (2). Drop remainder to collapse with reference.
Age × Race(3) × Gender	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for each level of age.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Collapse (2,1,1) & (3,1,1).
State × Age × Race(3 level)	9*5*3	64	36 - Collapse (1,1,2) & (1,1,3). Do the same for all states except for (5).
State × Age × Hispanicity	9*5*2	32	16 - Keep (1,1,1) & (1,2,1). Do the same for states (2) & (4). Keep (5,1,1), (5,2,1), & (5,3,1). Do the same for state (7). Keep (3,*,1). Drop remainder due to nonconv.
State × Age × Gender	9*5*2	32	All levels present.
State × Race(3 level) × Hispanicity	9*3*2	16	8 - Collapse (1,2,1) & (1,3,1). Do the same for each state.
State × Race(3 level) × Gender	9*3*2	16	8 - Collapse (1,2,1) & (1,3,1). Do the same for each state.
State × Hispanicity × Gender	9*2*2	8	All levels present.
Total		328	247

Appendix D6

Model Group 6: East South Central

Table D6a NHSDA Person Weight GEM Modeling Summary (Model Group 6: East South Central)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	7.02%	11.70%	1.27%	1.10984	208	(1.0, 2.0)	(1.05, 2.00)
	6.44%	10.50%	1.30%	1.11601	83	(1.0, 2.0)	(1.00, 1.96)
						(1.0, 2.0)	(1.00, 1.18)
<i>res.sdu.ps</i>	6.44%	10.50%	1.30%	1.11601	158	(0.3, 1.1)	(0.30, 1.10)
	1.35%	2.35%	0.30%	1.19152	124	(0.3, 2.7)	(0.30, 2.70)
						(0.9, 2.7)	(0.90, 2.59)
<i>sel.per.ps</i>	4.60%	12.30%	3.30%	2.92659	238	(0.4, 1.1)	(0.40, 1.10)
	2.34%	6.46%	1.23%	3.01989	157	(0.4, 3.2)	(0.40, 3.19)
						(0.9, 3.2)	(0.90, 3.20)
<i>res.per.nr</i>	2.12%	5.82%	1.38%	2.99605	238	(1.0, 3.0)	(1.00, 3.00)
	2.62%	8.83%	2.23%	3.67411	154	(1.0, 4.2)	(1.00, 4.20)
						(1.0, 4.2)	(1.00, 2.65)
<i>res.per.ps</i>	2.85%	9.57%	2.44%	3.67411	158	(0.3, 1.6)	(0.30, 1.60)
	0.94%	4.08%	0.50%	3.52775	98	(0.3, 4.2)	(0.30, 4.20)
						(0.9, 4.2)	n/a

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum / minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

**Table D6b Distribution of Weight Adjustment Factors and Weight Products
(Model Group 6: East South Central)**

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	33	0.72	220	0.24	137	140	0.28	61	0.39	61	0.18	21
1%	413	0.98	434	0.30	203	225	0.40	133	0.93	197	0.54	188
5%	422	1.01	451	0.76	428	494	0.59	430	1.00	460	0.88	469
10%	433	1.02	476	0.85	485	664	0.73	562	1.00	604	0.92	608
25%	523	1.03	534	0.93	583	837	0.84	773	1.03	853	0.98	868
Median	647	1.06	685	1.06	723	1,189	0.96	1,235	1.11	1,434	1.01	1,448
75%	710	1.09	774	1.26	897	2,935	1.12	2,924	1.24	3,327	1.05	3,280
90%	968	1.13	987	1.51	1,130	8,306	1.38	8,735	1.49	9,994	1.11	10,051
95%	1,055	1.18	1,234	1.71	1,280	10,766	1.62	12,083	1.73	14,898	1.18	14,683
99%	1,265	1.30	1,461	2.21	2,160	17,260	2.55	19,402	2.78	26,477	2.38	27,792
Maximum	1,949	8.32	2,140	2.70	3,404	51,394	4.14	37,982	5.49	54,410	4.20	62,806
Max/Mean	3	7.75	3	2.41	4	18	4.04	13	4.84	23	4.07	17

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 6 Overview

Dwelling Unit Nonresponse

The first level of percent Hispanic had to be removed from the model due to zero sample. All other main effects were kept. The removal of the percent Hispanic variable from the main effects carried over into the two and three-factor effects, and in fact there were so few Hispanic respondents in this region, that none of the effects at the higher order had enough respondents to be kept in the model. All two-factor interactions between percent owner-occupied dwelling units, percent 'black,' and rent/housing variables were controlled at all levels. Among State two-factor effects, all 'MSA 1,000,000 or more' level population density crosses were removed due to either zero sample or exact linear combinations. Alabama maintained both levels of group quarters, but due to collinearity and singularity led to the removal of other State crosses. Exact linear combinations also removed Mississippi's interactions with percent owner-occupied and rent/housing. Similar small counts allowed only minimal inclusion of three-factor effects, leading to the select inclusion of Alabama and Mississippi's second level of percent owner-occupied in the cross with percent 'black.' The carry over effect from the two-factor effects also removed Mississippi's second level of percent 'black' in that cross. The State, rent/housing, percent 'black' effect was maintained for some of the Alabama crosses. One effect for Alabama, percent owner-occupied, rent/housing was retained in the model.

Dwelling Unit Poststratification

For the South Central States, all but two proposed one-factor and two-factor effects were kept in the model; 'American Indian/Alaska Native' and 'Asian' race categories were combined for the State by race interaction for all States. Among three-factor effects, race was further reduced in the age, race, Hispanicity interaction, and in the State, age, and race interaction for Alabama and Mississippi. Low counts for Hispanic respondents removed several variables in the three-factor effects. State, Hispanicity, and gender variables were all present except for Mississippi. The State by race by Hispanicity and State by age by Hispanicity effects were completely removed to maintain a convergent model. All other three-factor effects were controlled in full.

(Selected) Person-Level Poststratification

Once again for the South Central model, all main effects except for the first level of Hispanicity were kept. Among the two-factor effects, 'American Indian/Alaska Native' and 'Asian' were combined for the age race cross, race Hispanicity cross, and the State race cross. Removal of the first level of Hispanicity from the main effects propagated through the higher order interactions, leading to reductions in number of effects involving Hispanicity. The first two quintiles of the rent/housing were combined for the interaction with percent owner-occupied. All States combined their first two levels of percent 'black.' All levels of rent/housing were removed for Mississippi due to zero sample or exact linear combinations except for the third quintile. State

by age by gender was maintained in full. Race at the three-factor effect level was redefined by combining 'black' and 'other' for all effects. The race Hispanicity and gender interaction, along with the State Hispanicity and gender, State race and Hispanicity, and State age and Hispanicity interactions were removed from the model due to nonconvergence, zero sample, or exact linear combinations. Various other levels of the resulting three-factor effects were removed due to the aforementioned modeling problems.

(Respondent) Person-Level Nonresponse

The 'other group quarter' and 'college dorm' levels of group quarters were combined at the main effect level and percent Hispanic was removed from the model due to both singularity and nonconvergence. State interactions with race combined 'American Indian/Alaska Native' and 'Asian' for both Mississippi and Kentucky. For State and percent owner-occupied, percent owner-occupied used a combined '0-50%' level. Mississippi had problems with its rent/housing interaction, and as a result, all effects were dropped. Very few three-factor effects were kept. Age by race by gender was controlled for, but with race redefined to combine 'black' and 'other.' State by age by race employed a similar treatment for race, and also combined some of the higher age groups. Some effects in that cross were also removed to avoid a nonconvergent model. The State age and gender sample cross however, was controlled for in full.

(Respondent) Person-Level Poststratification

All one-factor effects were included in the final model, maintaining their initial levels. Race was redefined by combining 'American Indian/Alaska Native' and 'Asian' for the age race cross. Age and Hispanicity were retained by collapsing age groups to obtain a 35 or older category, which served as the reference level. Race and Hispanicity did not have enough sample for a cross that allowed convergence. The 'American Indian/Alaska Native' and 'Asian' categories of race were collapsed together for all States. Alabama and Mississippi combined Hispanic respondents for the state Hispanicity interaction. Within the three-factor effects, only Kentucky had sufficient sample to maintain a 12 to 17 Hispanic variable. State Hispanicity and gender was maintained after collapsing to match the two-factor effect collapses. The remainder of variables involving Hispanicity were removed. The State, age, and gender and State, race, and gender crosses were maintained in full.

**Exhibit D6.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 6: East South Central**

Variables	Level	Proposed	Final
One-Factor Effects		26	25
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	1 - Drop (1) due to sing.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		86	54
State × Quarter	4*4	9	All levels present.
State × Pop. Density	4*4	9	6 - Drop (*,1) due to zero counts/sing.
State × Group Quarter	4*3	6	2 - Keep (1,*). Drop remainder due to zero counts/sing.
State × %Black	4*3	6	4 - Drop (3,1) due to nonconv and (3,2) due to sing.
State × %Hispanic	4*3	6	0 - Drop all due to zero counts/sing.
State × %Owner-occupied	4*3	6	4 - Drop (3,*) due to sing.
State × Rent/housing	4*5	12	8 - Drop (3,*) due to zero counts/ sing.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	0 - Drop all due to zero counts/sing./ nonconv.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	0 - Drop all due to zero counts/sing./ nonconv.
Three-Factor Effects		96	9
State × %Owner × %Black	4*3*3	12	3 - Keep (1,2,*) & (3,2,1). Drop remainder due to zero counts/sing./ nonconv.
State × %Owner × %Hispanic	4*3*3	12	0 - Drop all due to sing. / exact lin. comb.
State × %Owner × Rent/housing	4*3*5	24	1 - Keep (1,2,1). Drop remainder due to sing. / exact lin. comb., nonconv.
State × Rent/house × %Black	4*3*5	24	5 - Keep (1,1,2), (1,2,*), & (1,3,*). Drop remainder due to sing. / exact lin. comb., nonconv.
State × Rent/housing × %Hispanic	4*3*5	24	0 - Drop all due to sing. / exact lin. comb., nonconv.
Total		208	83

**Exhibit D6.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 6: East South Central**

Variables	Level	Proposed	Final
One-Factor Effects		16	16
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		57	54
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	7 - Collapse (1,3) & (1,4). Do the same for all states.
State × Hispanicity	4*2	3	All levels present.
State × Gender	4*2	3	All levels present.
Three-Factor Effects		86	54
Age × Race(3) × Hispanicity	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for all other levels of Age.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	4*5*3	24	16 - Collapse (2,1,2) & (2,1,3). Do the same for all levels of Age within that state. Do the same for state (3).
State × Age × Hispanicity	4*5*2	12	0 - Drop (3,1,1) due to sing. Drop remainder due to nonconv.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	0 - Drop (3,3,1) due to sing. Drop all due to nonconv.
State × Race(3 level) × Gender	4*3*2	6	All levels present.
State × Hispanicity × Gender	4*2*2	3	2 - Drop (3,1,1).
Total		159	124

**Exhibit D6.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 6: East South Central**

Variables	Levels	Proposed	Final
One-Factor Effects		34	33
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	1 - (1) dropped due to sing.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		119	89
Age × Race(3)	5*3	8	4 - Collapse (1,2) & (1,3). Do the same for all levels of Age.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1).
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	2 - Drop (2,1) & (3,1) due to sing.
%Owner × Rent/housing	3*5	8	7 - Collapse (3,1) & (3,2).
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	0 - Drop (1,2) & (4,2) due to nonconv. Drop remainder due to sing.
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	6 - Collapse (1,3) & (1,4). Do the same for all states.
State × Hispanicity	4*2	3	All levels present.
State × Gender	4*2	3	All levels present.
State × %Black	4*3	6	3 - Collapse (1,1) & (1,2). Do the same for all states.
State × %Hispanic	4*3	6	1 - Keep (1,2). Drop remainder due to zero counts/sing.
State × %Owner-occupied	4*3	6	All levels present.
State × Rent/housing	4*5	12	9 - Drop (3,1), (3,3), & (3,4) due to zero counts/sing.
Three-Factor Effects		85	35
Age × Race(3) × Hispanicity	5*3*2	8	2 - Collapse (1,2,1) & (1,3,1). Do the same for level (2) of Age. Drop (3,2,1) due to nonconv. Drop remainder due to zero counts.
Age × Race(3) × Gender	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for all levels of Age.
Age × Hispanicity × Gender	5*2*2	4	2 - Collapse (1,1,1) & (2,1,1). Collapse (3,1,1) & (4,1,1).
Race3 × Hispanicity × Gender	3*2*2	2	0 - Drop due to nonconv.
State × Age × Race(3 level)	4*5*3	24	12 - Collapse (1,1,2) & (1,1,3). Do the same for all State × age combinations. Drop (2,4,3) & (3,4,3) due to zero counts.
State × Age × Hispanicity	4*5*2	12	0 - Drop all due to nonconv/ zero counts/sing.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	0 - Drop all due to nonconv, zero counts/sing.
State × Race(3 level) × Gender	4*3*2	6	3 - Collapse (1,2,1) & (1,3,1). Do the same for all states.
State × Hispanicity × Gender	4*2*2	3	0 - Drop all due to nonconv/ zero counts/sing.
Total		238	157

**Exhibit D6.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 6: East South Central**

Variables	Levels	Proposed	Final
One-Factor Effects		34	31
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	0 - Drop (1) due to zero counts. Drop (2) due to nonconv at desired bounds.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		119	92
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	0 - Drop (2,1) & (3,1) due to zero counts. Drop (2,2) & (3,2) due to nonconv.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	0 - Drop (*,1), (2,2), & (3,2) due to zero counts. Drop remainder due to nonconv.
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	7 - Collapse (2,3) & (2,4). Do the same for State (3).
State × Hispanicity	4*2	3	All levels present.
State × Gender	4*2	3	All levels present.
State × %Black	4*3	6	All levels present.
State × %Hispanic	4*3	6	0 - Drop all due to nonconv.
State × %Owner-occupied	4*3	6	3 - Collapse (1,2) & (2,2). Do the same for all states.
State × Rent/housing	4*5	12	8 - Drop (3,1), (3,3), & (3,4) due to zero counts. Drop (3,2) due to nonconv.
Three-Factor Effects		85	31
Age × Race(3) × Hispanicity	5*3*2	8	0 - Drop (3,3,1) & (4,*,1) due to zero counts. Drop (2,3,1) due to sing. Drop remainder due to nonconv.
Age × Race(3) × Hispanicity	5*3*2	8	0 - Drop (3,3,1) & (4,*,1) due to zero counts. Drop (2,3,1) due to sing. Drop remainder due to nonconv.
Age × Race(3) × Gender	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for each level of Age.
Age × Hispanicity × Gender	5*2*2	4	0 - Drop all due to nonconv.
Race3 × Hispanicity × Gender	3*2*2	2	0 - Drop all due to nonconv.
State × Age × Race(3 level)	4*5*3	24	12 - Collapse (1,1,2) & (1,1,3). Do the same for Ages (2) & (3) for State (1). Drop (2,1,3), (2,4,3), & (3,4,3) due to zero counts. Drop (1,4,*), (2,4,2), (2,3,2), (2,3,3), & (3,4,2) due to nonconv.
State × Age × Hispanicity	4*5*2	12	0 - Drop (1,4,1) & (3,1,1) due to zero counts. Drop (2,4,1) & (3,4,1) due to sing. Drop remainder due to nonconv.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	0 - Drop (3,3,1) due to zero counts. Drop (2,3,1) & (3,2,1) due to sing. Drop remainder due to nonconv.
State × Race(3 level) × Gender	4*3*2	6	0 - Drop (3,3,1) due to zero counts. Drop (2,3,1) & (3,2,1) due to sing. Drop remainder due to nonconv.
State × Hispanicity × Gender	4*2*2	3	0 - Drop (3,1,1) due to sing. Drop remainder due to nonconv.
Total		238	154

**Exhibit D6.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 6: East South Central**

Variables	Level	Proposed	Final
One-Factor Effects		16	16
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		57	45
Age × Race(3 level)	5*3	8	4 - Collapse (1,2) & (1,3). Do the same for all levels of Age.
Age × Hispanicity	5*2	4	2 - Drop (4,1) due to zero counts. Drop (3,1) to collapse with reference.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	0 - Drop all due to nonconv.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	6 - Collapse (1,3) & (1,4). Do the same for all states.
State × Hispanicity	4*2	3	2 - Collapse (1,1) & (3,1).
State × Gender	4*2	3	All levels present.
Three-Factor Effects		85	37
Age × Race(3) × Hispanicity	5*3*2	8	0 - Drop all due to nonconv.
Age × Race(3) × Gender	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for each level of age.
Age × Hispanicity × Gender	5*2*2	4	0 - Drop all due to nonconv.
Race3 × Hispanicity × Gender	3*2*2	2	0 - Drop all due to nonconv.
State × Age × Race(3 level)	4*5*3	24	12- Collapse (1,1,2) & (1,1,3). Do the same for each State × age combination.
State × Age × Hispanicity	4*5*2	12	1 - Keep (2,1,1). Drop (3,1,1) due to zero counts. Drop remainder due to nonconv.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	0 - Drop all due to nonconv.
State × Race(3 level) × Gender	4*3*2	6	All levels present.
State × Hispanicity × Gender	4*2*2	3	2 - Collapse (1,1,1) & (3,1,1).
Total		158	98

Appendix D7

Model Group 7: West South Central

Table D7a NHSDA Person Weight GEM Modeling Summary (Model Group 7: West South Central)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	6.01%	9.43%	0.91%	1.1133	208	(1.0, 1.3)	(1.01, 1.29)
	5.10%	7.96%	0.46%	1.1006	107	(1.0, 1.3)	(1.00, 1.25)
						(1.0, 1.3)	(1.00, 1.04)
<i>res.sdu.ps</i>	5.10%	7.96%	0.46%	1.1006	158	(0.3, 1.1)	(0.30, 1.10)
	1.96%	5.29%	1.19%	1.2060	146	(0.3, 3.0)	(0.30, 3.00)
						(0.9, 3.0)	(0.34, 3.00)
<i>sel.per.ps</i>	3.29%	9.33%	2.64%	3.2371	238	(0.4, 2.3)	(0.40, 2.30)
	1.63%	4.45%	0.88%	3.0478	183	(0.4, 2.5)	(0.40, 2.50)
						(0.5, 2.5)	(0.50, 1.48)
<i>res.per.nr</i>	1.90%	5.12%	1.11%	3.1203	238	(1.0, 2.5)	(1.01, 2.50)
	1.68%	4.32%	0.62%	3.4173	194	(1.0,3.0)	(1.00, 3.00)
						(1.0,3.0)	(1.00, 2.99)
<i>res.per.ps</i>	1.84%	5.24%	0.88%	3.4173	158	(0.25, 1.1)	(0.25, 1.10)
	0.46%	0.73%	0.13%	3.3688	124	(0.25, 3.2)	(0.26, 3.19)
						(0.9, 3.2)	(3.20, 3.20)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum / minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

**Table D7b Distribution of Weight Adjustment Factors and Weight Products
Model Group 7: West South Central)**

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	79	0.39	204	0.26	95	128	0.28	59	0.54	61	0.12	52
1%	312	0.95	317	0.35	211	225	0.41	132	0.99	183	0.28	158
5%	374	1.00	376	0.71	356	452	0.66	414	1.02	473	0.85	456
10%	431	1.01	453	0.83	444	579	0.76	557	1.05	638	0.92	622
25%	552	1.03	606	0.97	624	810	0.87	800	1.10	922	0.98	915
Median	675	1.05	718	1.07	766	1,311	0.99	1,308	1.18	1,524	1.01	1,531
75%	800	1.08	835	1.21	945	2,826	1.14	2,795	1.28	3,287	1.06	3,333
90%	920	1.11	1,000	1.44	1,250	8,050	1.28	7,915	1.47	9,212	1.10	9,172
95%	1,177	1.15	1,247	1.62	1,358	11,243	1.40	11,601	1.65	14,580	1.18	14,684
99%	1,204	1.20	1,325	2.40	2,482	19,647	1.81	19,997	2.14	28,495	1.52	28,353
Maximum	3,345	2.59	1,880	3.24	3,818	115,045	2.50	50,566	4.90	69,889	3.60	52,829
Max/Mean	5	2.45	3	2.90	5	39	2.47	18	3.98	20	3.55	15

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 7 Overview

Dwelling Unit Nonresponse

Among main effects, all effects except group quarters were maintained intact. In that case 'college dorm' collapsed with 'other group quarters' because of small sample sizes. All non-State two-factor interactions were maintained. State two-factor interaction terms had population density level 'MSA 1,000,000 or more' removed for both Louisiana and Oklahoma because of zero sample. The Louisiana sample proved unable to support even the combined group quarters levels dictated by the collapsing done in the main effects, but Texas and Oklahoma had no problems. For the State percent of segments that are Hispanic, only the '10-50%' level for Texas was maintained. All others were dropped either because of singularities or to correct zero sample situations in the reference level. For State interactions with rent/housing value, all levels were kept except the third and fourth quintile for Louisiana and the fourth quintile of Texas, all of which were excluded in order to make the reference levels non-zero. Many variables were removed in the three-factor interactions. In State percent owner-occupied, percent 'black,' levels two and three percent owner-occupied were combined for '<10% black' in Louisiana, and level three owner-occupied '<10% black' for Oklahoma was removed due to zero sample. In Texas, a '0-50%' level was created for the cross of percent Hispanic by percent owner-occupied for all levels of that variable. The remainder of variables in that cross were removed due to zero sample. None of the interactions involving State, percent owner-occupied, and rent/housing were kept in the model. Because of singularities, zero sample, and maintenance of the hierarchy of variable definitions, most of the effects crossing rent/housing, percent 'black,' and State were excluded. Of those remaining, a '0-50% black' was created for each of the first three levels of rent/housing in Texas and the first level of rent/housing in Louisiana. Lastly, a single rent/housing level one by '10-50% black' was maintained in Oklahoma.

Dwelling Unit Poststratification

Like most other models, all main effects were kept. In two-way interactions, all were maintained except race by Hispanicity and State by race: 'other' Hispanic and 'black' Hispanic were combined and 'American Indian/Alaska Native' and 'Asian' were grouped together for all States. Since race by Hispanicity was simplified to 'white' Hispanic versus 'non-white' Hispanic, higher order effects involving these terms were adjusted accordingly. All other proposed three-factor effects were maintained in full.

(Selected) Person-Level Poststratification

With the exception of 'college dorm' and 'other group quarters' being pooled, all main effects were left intact. A breakdown of Hispanic respondents by race provided insufficient sample to

support both independent 'black' and 'other' categories, so the samples were aggregated. Similarly, small numbers and the related convergence problems led to State specific counts of 'American Indian/Alaska Native' and 'Asian' were grouped for Texas and Oklahoma, and dropped for Louisiana. State segment level percentages of Hispanics were not entirely supported either: sampling yielded sufficient respondents only in the 10-50% range for Texas and the <10% range in Oklahoma. Counts of respondents from the various ranges of 'percent owner-occupied dwelling units within segments' of each State fared better however, and only those <50% in Louisiana were deemed inadequate. Also considered for States was another segment characteristic: rent/housing value quintiles. Most (the fourth and fifth quintile were combined) were controlled for in Texas but only the first was for Oklahoma and none for Louisiana.

After dissecting the sample still more finely through three factor cross-sectioning, some adjustments were made through the simplification of the original levels. For example, none of the effects corresponding to the interactions of either age, race, and Hispanicity or State, age, and Hispanicity were included. When splitting race by Hispanicity and gender, 'black' and 'other' were combined. Hierarchical effects contributed to the compression of three-factor effects containing the state Louisiana's 'other' race respondents across age groups. Convergence forced the same compression across all age groups in Oklahoma. Maintaining the hierarchy also led to the exclusion of Louisiana's 'other' race category when crossing State, race, and gender.

(Respondent) Person-Level Nonresponse

All the main effects were kept except the collapsing of 'college dorm' with 'other group quarters'. The 'black' and 'other' Hispanic sample was combined when race was crossed by Hispanicity. Interactions between segment characteristic variables and States saw some collapsing of levels percent Hispanic and rent/housing value. In Louisiana and Oklahoma, '50-100% Hispanic' was dropped due to lack of sample, and non-zero reference levels caused the removal of Louisiana '10-50% Hispanic' and Texas '50-100% Hispanic.' All other State interactions were maintained in full.

Convergence required the complete removal of all effects from the race, Hispanicity, age interaction. The remainder of non-State three factor crosses were maintained in full. Crosses of two-factor effects and States were reduced in the case of State by age by race through the removal of all effects involving Louisiana because of small or zero sample sizes. When Hispanicity was partitioned by age within States, convergence issues in both Louisiana and Oklahoma samples led to the complete removal of those variables. 'Black' and 'other' race categories were combined when crossed with Hispanicity and State due to the collapsing that occurred at the lower order. This same 'black' plus 'other' grouping was used in the cross of

State, race, and gender in Louisiana and Oklahoma. However, all State by age by gender and State by Hispanicity by gender were kept.

(Respondent) Person-Level Poststratification

The main effects and most of the two-factor effects of this model were kept at levels proposed. Changes to the interaction of race and Hispanicity resulted in 'black' and 'other' being combined. At the State level, samples of 'American Indian/Alaska Native' and 'Asian' were too small to support independently and were combined within each State.

Among higher order effects, the age, race, Hispanicity interaction was removed from consideration and 'black' and 'other' samples were combined for the interaction of race, Hispanicity, and gender. Likewise, convergence issues caused 'black' and 'other' to be combined where interacting with age and State. Within this interaction, zero sample size forced dropping of the 'non-white' 35 to 49 effect. No State interactions with Hispanicity and age or race were supported within Louisiana or Oklahoma and were excluded for both. The remainder of three-factor effects were controlled for without compromise.

**Exhibit D7.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 7: West South Central**

Variables	Level	Proposed	Final
One-Factor Effects		22	21
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		86	68
State × Quarter	4*4	9	All levels present.
State × Pop. Density	4*4	9	Drop (2,1) & (3,1).
State × Group Quarter	4*3	6	2 - Factor levels collapsed at lower order. Drop (2,*).
State × %Black	4*3	6	All levels present.
State × %Hispanic	4*3	6	1 - Keep (4,2). Drop (4,1) due to sing. Drop remainder to make reference nonzero.
State × %Owner-occupied	4*3	6	All levels present.
State × Rent/housing	4*5	12	5 - Drop (2,3), (2,4) & (4,4) for nonzero ref. Drop (2,2), (3,2), (3,3), & (3,4) due to zero counts.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	All levels present.
Three-Factor Effects		96	18
State × %Owner × %Black	4*3*3	12	10 - Collapse (2,2,1) & (2,3,1) Drop (3,3,1) due to zero counts.
State × %Owner × %Hispanic	4*3*3	12	2 - Collapse (4,2,1) & (4,2,2). Collapse (4,3,1) & (4,3,2). Drop remainder to make reference nonzero.
State × %Owner × Rent/house	4*3*5	24	0 - Drop all levels.
State × Rent/house × %Black	4*3*5	24	6 - Keep (2,1,*), (3,1,2), (4,1,2), (4,2,1), & (4,3,1). Drop (3,3,*) & (3,4,*) due to zero sample. Drop (2,3,*), (2,4,*), & (4,4,*) to make reference nonzero.
State × Rent/house × %Hispanic	4*3*5	24	Drop all levels
Total		208	107

**Exhibit D7.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 7: West South Central**

Variables	Level	Proposed	Final
One-Factor Effects		16	16
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		57	53
Age*Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1)
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	6 - Collapse (1,3) & (1,4). Do the same for all States.
State × Hispanicity	4*2	3	All levels present.
State × Gender		4*2	3All levels present.
Three-Factor Effects		85	77
Age × Race(3) × Hispanicity	5*3*2	8	4 - Factor level collapsed at lower order.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Factor level collapsed at lower order.
State × Age × Race(3 level)	4*5*3	24	All levels present.
State × Age × Hispanicity	4*5*2	12	All levels present.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	3 - Factor level collapsed at lower order.
State × Race(3 level) × Gender	4*3*2	6	All levels present.
State × Hispanicity × Gender	4*2*2	3	All levels present.
Total		158	146

**Exhibit D7.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 7: West South Central**

Variables	Levels	Proposed	Final
One-Factor Effects		34	33
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		119	101
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1).
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	5 - Factor level collapsed at lower order. Drop resulting (2,3) due to nonconv.
State × Hispanicity	4*2	3	All levels present.
State × Gender	4*2	3	All levels present.
State × %Black	4*3	6	All levels present.
State × %Hispanic	4*3	6	2 - Drop (2, *) due to zero counts. Drop (3, 2) to make reference nonzero. Drop (3,1) due to sing.
State × %Owner-occupied	4*3	6	5 - Collapse (2,2) & (2,3) due to nonconv.
State × Rent/housing	4*5	12	4 - Drop (3,3) & (3,4) due to zero counts. Drop (2,*) & (4,4) to make the reference nonzero. Drop (3,2) due to sing.
Three-Factor Effects		85	49
Age × Race(3) × Hispanic	5*3*2	8	0 - Drop all levels.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Factor level collapsed at lower order.
State × Age × Race(3 level)	4*5*3	24	16 - Factor level dropped at lower order. Collapse (3,1,2) & (3,1,3). Do the same for all levels of age in State (3) due to nonconvergence.
State × Age × Hispanicity	4*5*2	12	0 - Drop all levels.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	0 - Drop all levels.
State × Race(3 level) × Gender	4*3*2	6	5 - Factor level dropped at lower order.
State × Hispanicity × Gender	4*2*2	3	All levels present.
Total		238	183

**Exhibit D7.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 7: West South Central**

Variables	Levels	Proposed	Final
One-Factor Effects		34	33
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Drop (2) due to zero count.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		119	107
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1).
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	All levels present.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	All levels present.
State × Hispanicity	4*2	3	All levels present.
State × Gender	4*2	3	All levels present.
State × %Black	4*3	6	All levels present.
State × %Hispanic	4*3	6	2 - Drop (2,1), (3,1) due to zero counts. Drop (4,1) & (2,2) to make reference nonzero.
State × %Owner-occupied	4*3	6	All levels present.
State × Rent/housing	4*5	12	5 - Drop (3,3), (3,4) due to zero counts. Drop (2,3), (2,4), (3,2), & (4,4) to make reference nonzero. Drop (2,2) due to sing.
Three-Factor Effects		85	54
Age × Race(3) × Hispanicity	5*3*2	8	0 - Drop all levels.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	0 - Drop all levels.
State × Age × Race(3 level)	4*5*3	24	16 - Drop (2,*,*) to make reference nonzero and convergent.
State × Age × Hispanicity	4*5*2	12	4 - drop (2,*,*) & (3,*,*) due to nonconv.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	3 - Factor level collapsed at lower order.
State × Race(3 level) × Gender	4*3*2	6	4 - Collapse (2,2,1) & (2,3,1). Do the same for State (3).
State × Hispanicity × Gender	4*2*2	3	All levels present.
Total		238	194

**Exhibit D7.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 7: West South Central**

Variables	Level	Proposed	Final
One-Factor Effects		16	16
Intercept	1	1	All levels present.
State	4	3	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		57	53
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1) due to nonconv.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	4*4	9	All levels present.
State × Age	4*5	12	All levels present.
State × Race(4 level)	4*4	9	6 - Collapse (1,3) & (1,4) due to nonconv. Do the same for all States.
State × Hispanicity	4*2	3	All levels present.
State × Gender	4*2	3	All levels present.
Three-Factor Effects		85	53
Age × Race(3) × Hispanicity	5*3*2	8	0 - Drop all levels.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Factor level collapsed at lower order.
State × Age × Race(3 level)	4*5*3	24	15 - Drop (2,4,*) to make reference nonzero. Collapse (2,1,2), (2,1,3), (3,1,2), & (3,1,3) due to nonconv. Do the same for all levels of age.
State × Age × Hispanicity	4*5*2	12	4 - Drop (2,*,*) & (3,*,*) due to nonconv.
State × Age × Gender	4*5*2	12	All levels present.
State × Race(3 level) × Hispanicity	4*3*2	6	2 - Drop (2,*,*) & (3,*,*) due to nonconv.
State × Race(3 level) × Gender	4*3*2	6	All levels present.
State × Hispanicity × Gender	4*2*2	3	All levels present.
Total		158	124

Appendix D8

Model Group 8: Mountain

Table D8a NHSDA Person Weight GEM Modeling Summary (Model Group 8: Mountain)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	5.24%	6.40%	1.92%	1.4203	408	(1.0, 3.4)	(1.05, 3.34)
	4.40%	5.20%	1.61%	1.4212	126	(1.0, 1.7)	(1.00, 1.70)
						(1.0, 1.7)	(1.00, 1.64)
<i>res.sdu.ps</i>	4.98%	4.85%	0.53%	1.4027	294	(0.35, 1.5)	(0.36, 1.50)
	0.93%	2.02%	0.27%	1.4751	245	(0.35, 3.2)	(0.35, 3.20)
						(0.9, 3.2)	(0.96, 3.20)
<i>sel.per.ps</i>	3.11%	6.89%	1.46%	3.4243	414	(0.3, 3.5)	(0.30, 3.45)
	1.59%	2.85%	0.66%	3.4765	334	(0.3, 4.0)	(0.30, 4.00)
						(0.9, 4.0)	(0.90, 0.94)
<i>res.per.nr</i>	1.75%	3.48%	0.82%	3.4007	414	(1.0, 3.0)	(1.00, 2.99)
	1.57%	2.70%	0.63%	3.9217	287	(1.0, 3.2)	(1.00, 3.20)
						(1.0, 3.2)	(1.15, 1.15)
<i>res.per.ps</i>	1.67%	2.91%	0.71%	3.9217	294	(0.2, 2.0)	(0.20, 2.00)
	1.56%	2.68%	0.55%	3.9328	251	(0.2, 2.2)	(0.20, 2.20)
						(0.9, 2.2)	(1.00, 2.20)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum/minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

Table D8b Distribution of Weight Adjustment Factors and Weight Products (Model Group 8: Mountain)

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	16	0.39	81	0.31	33	35	0.17	30	0.39	31	0.12	8
1%	84	0.91	90	0.45	80	82	0.35	75	1.00	83	0.25	72
5%	89	1.01	94	0.72	114	157	0.65	136	1.01	164	0.77	153
10%	137	1.01	140	0.85	153	192	0.75	180	1.04	218	0.86	218
25%	179	1.03	190	1.02	227	344	0.88	339	1.10	403	0.95	399
Median	321	1.05	335	1.18	367	750	0.99	729	1.21	916	1.01	903
75%	561	1.08	587	1.33	659	1,738	1.10	1,706	1.35	2,175	1.06	2,182
90%	760	1.12	811	1.62	941	3,262	1.26	3,200	1.54	4,126	1.17	4,099
95%	812	1.15	872	1.83	1,102	5,202	1.41	5,175	1.70	6,630	1.31	6,751
99%	1,040	1.31	1,016	2.47	1,449	13,603	1.88	12,751	2.22	17,655	1.81	17,489
Maximum	1,719	7.41	1,571	4.30	2,996	27,828	4.00	26,760	3.20	48,202	3.63	54,460
Max/Mean	5	5.55	4	3.67	6	19	3.97	20	2.54	25	3.58	28

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 8 Overview

Dwelling Unit Nonresponse

Once again, all main effects were kept in the model except group quarters, where 'college dorm' was combined with 'other group quarters.' In non-State two-factor interactions, percent owner-occupied by percent 'black' removed '<10% owner occupied,' '50-100% black' due to zero sample. All percent owner-occupied rent/housing interactions were kept except that levels one and two of rent/housing were combined for '<10%' owner occupied. The cross of rent/housing value with percent 'black' was reduced by removing the first three levels of rent/housing involving percent 'black' (because of zero sample) and the interaction of rent/housing's second quintile and '10-50% black' was collapsed with the reference due to nonconvergence. Levels for State broken down by population density excluded the 'MSA 1,000,000 or more' category for Idaho, Montana, Nevada, New Mexico and Wyoming due to zero sample. No State had sufficient sample to allow a convergent model that included State specific group quarter variables. Only effects involving '10-50% black' were kept for States Colorado, Nevada, New Mexico, and Wyoming. Others were dropped because of zero sample—either in the effect itself or in the reference level. State measures of percent Hispanic excluded '50-100%' for Montana, Utah, and Wyoming due to empty cells. A '10-100%' level was created for both Idaho and Wyoming where State was crossed with percent owner-occupied. None rent/housing value interactions were kept for Montana or Wyoming. Many other State, rent/housing variables were removed due to zero sample and convergence problems: All but the fourth quintile for Nevada, the first quintile for Colorado and New Mexico, the fourth quintiles of Utah and Idaho, and the third quintile for Utah. In addition, the first and second quintile were combined for Utah in order to obtain a convergent model. None of the three-factor interactions were maintained.

Dwelling Unit Poststratification

All main effects and non-State two factor interactions were kept. Although the 'quarter' covariate usually didn't lead to problems, Utah's third quarter was collapsed with it's fourth quarter due to nonconvergence. In Idaho, Wyoming, and Montana insufficient sample led to combining 'black' respondents for all three States in order to obtain a convergent model. Moving on to higher order effects, 'black' and 'other' Hispanics were combined for the 12 to 17, 18 to 25, and 35 to 49 age groups. Factors involving States also combined 'black' and 'other' race samples for all age groups in Idaho, Wyoming, and Montana, due to the fact the race by State samples of these groups had already been combined at a lower order. For Utah, no 'black' respondents age 26 to 34 were present and the covariate was thus excluded. Convergence issues due to continued problems of small sample sizes led to the compression of race covariate definitions into 'white' and 'non-white' across the remainder of age groups in Utah, and the 12 to 17 age group in New Mexico. None of the State, race, Hispanicity covariates were included. State by

race by gender was also affected by the prior collapsing of Idaho, Wyoming, and Montana 'black' respondents. The remainder of higher order effects were maintained in full.

(Selected) Person-Level Poststratification

No main effects were compromised in the Mountain model. A level '10-50%' was created for the interaction of percent 'black' with '50-100% owner-occupied' and the first three quintiles of rent/housing, because of zero sample or singularities. All other two-factor effects not involving States were present. Subdividing factors by State was largely successful for quarter, age, race, Hispanicity, and gender. Breakdowns of segment characteristics by State however, required several changes from the initial strategy. Percent black was largely removed due to modeling constraints, leaving only the '10-50%' level for Colorado and New Mexico. Percent Hispanic was maintained to a greater extent, losing only '50-100% Hispanic' from Montana, Utah, and Wyoming due to lack of sample. Owner-occupied percentages were also well represented, excluding only the '<10%' level for Idaho. State quintiles of rent/housing value were reduced by total exclusion of Montana and Nevada variables, the first quintile for Colorado, New Mexico, and the fourth quintile for Utah and Wyoming were all lost due to zero respondents. In addition, Idaho's fourth quintile and Wyoming's third were combined with the reference to fix zero reference sample situations.

Race and Hispanicity interactions involving age were adjusted by dropping the 35 to 49 age range into the reference cell for 'black' respondents, and combining the 'black' and 'other' race categories for the 12 to 17 and 18 to 25 age ranges. When crossing race and Hispanicity by gender, the same combined race category was used. However, no interactions involving the race, Hispanicity pair and State were retained in the model. Neither Wyoming, Idaho, nor Montana supported age, race breakdowns, due largely to insufficient sample. A lack of sample removed the 'black' 26 to 34 sample from consideration for Utah.

(Respondent) Person-Level Nonresponse

Mountain model group main effects were controlled for in full. Interactions of two factors that required adjustment included segment characteristics percent owner-occupied by percent 'black;' '10-100% black' was used for the '<10% owner-occupied' level. Another segment level variable cross, rent/housing value by percent 'black,' combined the '10-50 %' and '50-100%' levels of percent 'black' for the first three quintiles of rent/housing. At the State level, quarter, age, Hispanicity, and gender were maintained at proposed levels. Race categories 'other' and 'black' were combined for Wyoming and Idaho due to nonconvergence of the model. Segment percent 'black' was difficult to maintain at the State level, with only the '10-50%' range kept for Colorado and New Mexico. The equivalent percent Hispanic variable was more successfully utilized, losing only the '50-100%' range in Montana, Utah, and Wyoming. Segment percent of owner-

occupied dwelling units also fared well, where only the Idaho '<10%' level was removed. The final segment characteristic variable, rent/housing value, was forced to be removed and redefined at several levels due to lack of sample. The first quintiles rent/housing in Colorado and New Mexico, the third quintiles in Utah and Wyoming, and the fourth quintiles in Utah, Wyoming, and Idaho were not controlled for directly. Colorado's second and third quintiles were combined. Montana and Nevada effects were completely excluded.

No Hispanicity, age, race combinations were included, but all other non-State three-factor effects were included. Higher order State interactions were retained as originally proposed for State by age and gender, and State by Hispanicity and gender, but completely removed for State by age and race, and State by race and Hispanicity. Hispanic respondents in Montana and Wyoming were combined within each age group. In all interactions with race and gender, each State's race 'other' was collapsed with 'black,' and in addition, Idaho and Wyoming samples were pooled.

(Respondent) Person-Level Poststratification

Again all main effects were captured and minor compromise to the originally planned levels of two-factor effects was required: Wyoming and Idaho samples of 'black' respondents were combined due to nonconvergence of the model. Non-State three-factor effects were also largely present with the exception being age by race by Hispanicity, which was lost entirely.

At the State level, the interaction of race and gender was reduced by excluding all Montana effects, and New Mexico, Utah, Idaho, and Wyoming combined 'black' and 'other'—Idaho and Wyoming because of the hierarchical nature of the model, and the others due to convergence problems. 'Black' and 'other' were also combined for the interaction of State, age, and race across all levels of age for Montana, Utah, Idaho, and Wyoming, and within age groups 12 to 17, 26 to 34 and 35 to 49 for New Mexico.

**Exhibit D8.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 8: Mountain**

Variables	Level	Proposed	Final
One-Factor Effects		26	25
Intercept	1	1	All levels present.
State	8	7	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		158	101
State × Quarter		8*4	21 All levels present.
State × Pop. Density	8*4	21	16 - Drop (2,1). Do the same for States (3), (4), (5), & (7).
State × Group Quarter	8*3	14	0 - Drop all due to nonconv.
State × %Black		8*3	144 - Drop (2,*), (3,*), (4,1), (5,1), (6,*), & (7,1).
State × %Hispanic	8*3	14	11 - Drop (3,1), (6,1), & (7,1).
State × %Owner-occupied	8*3	14	12 - Collapse (2,2) & (2,3) due to zero counts. Due the same for State (7) due to nonconv.
State × Rent/housing	8*5	28	11 - Drop (1,1), (3,*), (5,1), (5,2), (5,3), (6,4), (7,4) due to zero counts. Drop (2,4), (6,3), & (7,3) due to reference zero counts. Drop (7,1) & (7,2) due to nonconv. Collapse (6,1) & (6,2) due to nonconv.
%Owner × %Black	3*3	4	3 - Drop (3,1).
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	7 - Collapse (3,1) & (3,2) due to nonconv.
Rent/housing × %Black	5*3		84 - Drop (1,1), (2,*), & (3,1).
Rent/housing × %Hispanic	3*5	8	All levels present.
Three-Factor Effects		224	0
State × %Owner × %Black	8*3*3	28	0 - Drop all levels.
State × %Owner × %Hispanic	8*3*3	28	0 - Drop all levels.
State × %Owner × Rent/house	8*3*5	56	0 - Drop all levels.
State × Rent/house × %Black	8*3*5	56	0 - Drop all levels.
State × Rent/house × %Hispanic	8*3*5	56	0 - Drop all levels.
Total		408	126

**Exhibit D8.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 8: Mountain**

Variables	Level	Proposed	Final
One-Factor Effects		20	20
Intercept	1	1	All levels present.
State	8	7	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		105	102
Age*Race(3 level)	5*3	8	All levels present.
Age*Hispanicity	5*2	4	All levels present.
Age*Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	8*4	21	20 - Drop (6,3) due to nonconv.
State × Age	8*5	28	All levels present.
State × Race(4 level)	8*4	21	18 - Collapse (2,2), (3,2), & (7,2) due to nonconv.
State × Hispanicity	8*2	7	All levels present.
State × Gender		8*2	7All levels present.
Three-Factor Effects		169	123
Age × Race(3) × Hispanicity	5*3*2	8	5 - Collapse (1,2,1) & (1,3,1). Do the same for age levels (3) & (4).
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	8*5*3	56	30 - Factor levels collapsed at lower order. Collapse (6,2,2) & (6,2,3) due to zero counts. Collapse (6,1,2) & (6,1,3). Do the same for State (6) age levels (3) & (4). Collapse (5,1,2) & (5,1,3) due to nonconv.
State × Age × Hispanicity	8*5*2	28	All levels present.
State × Age × Gender	8*5*2	28	All levels present.
State × Race(3 level) × Hispanicity	8*3*2	14	0 - Drop all levels.
State × Race(3 level) × Gender	8*3*2	14	11 - Factor levels collapsed at lower order. Collapse (6,2,1) & (6,3,1) due to nonconv.
State × Hispanicity × Gender	8*2*2	7	All levels present.
Total		294	245

**Exhibit D8.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 8: Mountain**

Variables	Levels	Proposed	Final
One-Factor Effects		38	38
Intercept	1	1	All levels present.
State	8	7	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		207	172
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	3 - Drop (3,*) due to zero counts.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	5 - Collapse (1,1) & (1,2). Do the same for levels (2) and (3) of Rent/housing due to zero counts.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	8*4	21	All levels present.
State × Age	8*5	28	All levels present.
State × Race(4 level)	8*4	21	All levels present.
State × Hispanicity	8*2	7	All levels present.
State × Gender	8*2	7	All levels present.
State × %Black	8*3	14	2 - Keep (1,2) & (5,2). Drop remainder due to zero counts., to make reference cell non-zero, and nonconv.
State × %Hispanic	8*3	14	11 - Drop (3,1), (6,1), & (7,1) due to zero counts.
State × %Owner-occupied	8*3	14	13 - Drop (2,3) due to zero counts.
State × Rent/housing	8*5	28	13 - Drop (1,1), (3,*), (4,*), (5,1), (6,4), & (7,4) due to zero counts. Drop (2,4), (6,3), & (7,3) to make reference non-zero.
Three-Factor Effects		169	124
Age × Race(3) × Hispanicity	5*3*2	8	5 - Drop (4,2,1) to make reference nonzero. Collapse (1,*1). Do the same for age level (2) due to nonconv.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Collapse (*,1,1) due to nonconv.
State × Age × Race(3 level)	8*5*3	56	31 - Drop (2,*,*), (3,*,*), (6,3,2), (7,*,*) due to zero counts. or small counts.
State × Age × Hispanicity	8*5*2	28	All levels present.
State × Age × Gender	8*5*2	28	All levels present.
State × Race(3 level) × Hispanicity	8*3*2	14	0 - Drop all levels.
State × Race(3 level) × Gender	8*3*2	14	12 - Collapse (2,*1) to make reference non-zero. Do the same for State (3).
State × Hispanicity × Gender	8*2*2	7	All levels present.
Total		414	334

**Exhibit D8.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 8: Mountain**

Variables	Levels	Proposed	Final
One-Factor Effects		38	38
Intercept	1	1	All levels present.
State	8	7	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		207	170
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	3 - Collapse (2,*) due to zero counts.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	5 - Collapse (1,*) due to zero counts. Do the same for levels (2) & (3) of Rent/housing.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	8*4	21	All levels present.
State × Age	8*5	28	All levels present.
State × Race(4 level)	8*4	21	20 - Collapse (2,2) & (7,2) due to nonconv.
State × Hispanicity	8*2	7	All levels present.
State × Gender	8*2	7	All levels present.
State × %Black	8*3	14	2 - Drop (1,1), (2,*), (3,*), (5,1), (6,*), & (7,1) due to zero counts. Drop (4,*) to make reference non-zero. Drop (7,2) due to nonconv.
State × %Hispanic	8*3	14	11 - Drop (3,1), (6,1), & (7,1) due to zero counts.
State × %Owner-occupied	8*3	14	13 - Drop (2,3) due to zero counts.
State × Rent/housing	8*5	28	12 - Drop (1,1), (3,*), (4,*), (5,1), (6,4), (7,4) due to zero counts. Drop (2,4), (6,3), & (7,3) to make reference nonzero. Collapse (1,2) & (1,3) due to nonconv.
Three-Factor Effects		169	79
Age × Race(3) × Hispanicity	5*3*2	8	0 - Drop all levels.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	8*5*3	56	0 - Drop all levels.
State × Age × Hispanicity	8*5*2	28	24 - Collapse (2,1,1) & (7,1,1). Do the same for all levels of age.
State × Age × Gender	8*5*2	28	All levels present.
State × Race(3 level) × Hispanicity	8*3*2	14	0 - Drop all levels.
State × Race(3 level) × Gender	8*3*2	14	6 - Factor levels collapsed at lower order. Collapse (1,2,1) & (1,3,1). Do the same for all States.
State × Hispanicity × Gender	8*2*2	7	All levels present.
Total		414	287

**Exhibit D8.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 8: Mountain**

Variables	Level	Proposed	Final
One-Factor Effects		20	20
Intercept	1	1	All levels present.
State	8	7	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		105	104
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	8*4	21	All levels present.
State × Age	8*5	28	All levels present.
State × Race(4 level)	8*4	21	20 - Collapse (2,2) & (7,2) due to nonconv.
State × Hispanicity	8*2	7	All levels present.
State × Gender	8*2	7	All levels present.
Three-Factor Effects		169	127
Age × Race(3) × Hispanicity	5*3*2	8	0 - None
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	8*5*3	56	33 - Factor level collapsed at lower order. Collapse (3,1,2) & (3,1,3) due to zero counts. or small counts. Do the same for all levels of age. Do the same for States (5) & (6), except for age level 2 of State (5) due to nonconv.
State × Age × Hispanicity	8*5*2	28	All levels present.
State × Age × Gender	8*5*2	28	All levels present.
State × Race(3 level) × Hispanicity	8*3*2	14	9 - Factor level collapsed at lower order. Collapse State (3) with previously combined States (2) & (7).
State × Race(3 level) × Gender	8*3*2	14	8 - Factor level collapsed at lower order. Drop (3,* ,1) due to zero counts. Collapse (5,2,1), (5,3,1), (6,2,1) & (6,3,1) due to nonconv.
State × Hispanicity × Gender	8*2*2	7	All levels present.
Total		294	251

Appendix D9

Model Group 9: Pacific

Table D9a NHSDA Person Weight GEM Modeling Summary (Model Group 9: Pacific)

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# XVAR ³	Bounds ⁴	
	Unweighted	Weighted	Winsorized			Nominal	Realized
<i>res.sdu.nr</i>	9.15%	14.60%	3.34%	1.2805	255	(1.0, 1.4)	(1.00, 1.40)
	5.29%	7.76%	0.68%	1.2614	98	(1.0, 1.65)	(1.00, 1.65)
						(1.0, 1.65)	(1.02, 1.65)
<i>res.sdu.ps</i>	5.29%	7.76%	0.68%	1.2614	192	(0.5, 1.05)	(0.50, 1.05)
	1.53%	2.77%	0.43%	1.2738	143	(0.5, 2.8)	(0.50, 2.80)
						(0.9, 2.8)	(0.90, 2.80)
<i>sel.per.ps</i>	3.48%	9.69%	2.35%	3.9920	282	(0.3, 2.5)	(0.30, 2.50)
	1.55%	4.44%	1.03%	3.7850	236	(0.3, 2.8)	(0.30, 2.80)
						(0.9, 2.8)	(0.91, 2.80)
<i>res.per.nr</i>	1.88%	5.99%	1.40%	3.8727	282	(1.0, 2.9)	(1.00, 2.90)
	1.81%	5.11%	0.81%	4.6366	212	(1.0, 3.6)	(1.00, 3.60)
						(1.0, 3.6)	(1.00, 1.11)
<i>res.per.ps</i>	2.21%	5.90%	0.97%	4.6366	192	(0.31, 1.1)	(0.31, 1.10)
	0.63%	0.60%	0.10%	4.5637	171	(0.31,2.3)	(0.31, 2.30)
						(0.91,2.3)	(0.90, 2.30)

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

² Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

³ Number of proposed covariates on top line, and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum/minimum values for the GEM adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the non-extreme values, and the low-extreme values.

Table D9b Distribution of Weight Adjustment Factors and Weight Products (Model Group 9: Pacific)

	<i>res.sdu.nr</i> ¹			<i>res.sdu.ps</i> ¹		<i>sel.per.ps</i> ¹			<i>res.per.nr</i> ¹		<i>res.per.ps</i> ¹	
	1-6	7	1-7	8	1-8	1-10	11	1-11	12	1-12	13	1-13
Minimum	32	0.64	94	0.35	51	51	0.17	36	0.28	40	0.11	14
1%	97	0.81	101	0.51	93	101	0.44	97	1.00	99	0.31	101
5%	116	0.94	127	0.79	125	150	0.72	152	1.00	164	0.51	177
10%	151	1.01	161	0.90	175	282	0.80	276	1.02	299	0.87	280
25%	493	1.05	525	1.01	573	716	0.90	691	1.11	805	0.96	813
Median	535	1.08	596	1.10	669	1,254	1.01	1,256	1.21	1,465	1.04	1,454
75%	641	1.13	717	1.21	835	2,621	1.11	2,696	1.36	3,202	1.11	3,186
90%	950	1.21	1,047	1.42	1,125	9,355	1.24	9,248	1.59	10,837	1.29	10,805
95%	960	1.28	1,153	1.63	1,344	14,779	1.40	14,904	1.79	18,507	1.42	18,655
99%	1,482	1.49	1,889	2.72	2,023	25,264	1.92	24,859	2.45	37,994	2.02	37,848
Maximum	3,636	6.41	2,341	2.87	4,190	81,874	3.13	59,010	3.60	85,218	2.49	79,705
Max/Mean	6	6.69	4	2.51	6	26	3.07	19	2.81	21	21.20	20

¹ For a key to modeling abbreviations, see Chapter 5, Exhibit 5A.

Model Group 9 Overview

Dwelling Unit Nonresponse

Group quarters was defined to combine 'college dorm' and 'other group quarter.' All other main effects are present in unaltered form. Except for the fourth quintile of rent/housing by '<10% black,' all other non-State two-factor effects are present. Among the State variable combinations, all quarter interaction variables are present but all other interaction categories are affected by some cells of zero sample size. Percent Hispanic is present for Oregon only, and the first level of percent 'black' is present for Oregon and California, the second level for Alaska. Hawaii group quarters was removed due to nonconvergence. 'MSA of 1,000,000 or more' population density at the State level was removed for Alaska and Hawaii. Levels one and two of percent owner-occupied were combined within each State in this model group. Singularities removed all State by rent/housing, by percent 'black' or percent Hispanic.

Dwelling Unit Poststratification

No main effects were compromised. Within two-factor effects, 'black' and 'other' were combined for the cross with Hispanicity, and small counts of Hispanics led to a contrast of California and Washington with a combined sample of Alaska, Hawaii, and Oregon. The hierarchical nature of the modeling impacted three-factor effects and forced a redefinition of all effects involving the race and Hispanicity interaction. Otherwise, the only other modification to the higher order terms was the removal of California race Hispanicity interaction variables.

(Selected) Person-Level Poststratification

Proposed levels of the main effects were maintained in the Pacific model at this stage. A zero count in the fourth quintile rent/housing '<10% black' cell caused it's removal. Similarly, in the State by percent 'black' interactions, factor effects corresponding to the Alaska, Hawaii, and Oregon '<10%' were removed from the model due to zero sample. '<10%' and '10-50%' levels were combined in California. Percent Hispanic was not supported at the '<10%' level in Alaska and Hawaii, and an exact linear combination removed it from the California cross. Several levels of rent/housing were also not supported at the State level, most notably in Oregon, where all levels were removed, and Hawaii, which was used to support low numbers in Washington, the reference State. At the three-factor interaction level, interactions between age, race, Hispanicity, and gender were largely supported, with only some values of the age, race, by Hispanicity cross compromised. Three-factor effects involving crosses with race and another variable were reduced, either by cell singularities, convergence issues, or collapsing. State crosses involving age, Hispanicity, and gender but excluding race, were maintained in full.

(Respondent) Person-Level Nonresponse

As usual, the only main effect simplified was group quarters, where 'college dorm' was collapsed with 'other group quarters.' Due to singularities, rent/housing crossed with percent 'black' was reduced by dropping '<10% black' by the fourth quintile of rent/housing. In Oregon, race levels 'black' and 'other' were combined. Moving on to segment characteristics at the State level, Oregon, Hawaii, and Alaska had '<10% black' and '<10% Hispanic' dropped. Within State rent/housing quintiles, the first was dropped for California, the third and fourth for Alaska, and all levels for Hawaii and Oregon.

In the three-factor effects, age by race by Hispanicity, race level 'other' was collapsed with race level 'black' for all interactions. For race by Hispanicity by gender, race level 'others' was collapsed with race level 'black' for all interactions. For Alaska, Hawaii, and Oregon all interactions of age by race, age by Hispanicity, and race by Hispanicity were dropped. Within Oregon, race by gender was simplified by combining 'others' and 'black' for Oregon, and the Hawaii race by gender interaction was dropped.

(Respondent) Person-Level Poststratification

Lastly, in the Pacific model, main effects were unchanged but in Oregon race was redefined to a two-level variable, which resulted from combining 'American Indian/Alaska Native,' 'Asian,' and 'Black.'

All interactions of age by race by Hispanicity were modified to have an expanded 35 or older reference age level. Due to the hierarchical nature of the model, State interaction with age and race was modified by combining 'black' and 'other' within all levels of age in Oregon. Race was also redefined in this manner for age categories 12 to 17 and 35 to 49 in Hawaii. Age ranges 26 to 34 and 35 to 49 were dropped from Oregon. State by age and Hispanicity did not support an age 35 to 49 effect for Alaska. Also, State by race by Hispanicity was adjusted by combining 'black' and 'other' race within Oregon, and completely dropping effects for Alaska and Hawaii. The combination of 'black' plus 'other' was also used in the Hawaii interaction with race and gender. Effects corresponding to the interaction of race, gender were dropped for Oregon.

**Exhibit D9.1 Covariates for 2000 NHSDA Person Weights (res.sdu.nr)
Model Group 9: Pacific**

Variables	Level	Proposed	Final
One-Factor Effects		23	22
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/housing Value	5	4	All levels present.
Two-Factor Effects		104	71
State × Quarter	5*4	12	All levels present.
State × Pop. Density	5*4	12	10 - Drop (1,1) & (2,1) due to zero counts.
State × Group Quarter	5*3	8	3 - Collapsed at lower order. Drop (2,*) due to nonconv.
State × %Black	5*3	8	3 - Keep (1,2), (3,1), & (4,1). Drop remainder due to zero counts.
State × %Hispanic	5*3	8	2 - Keep (3,*). Drop remainder due to zero counts.
State × %Owner-occupied	5*3	8	4 - Collapse (1,2) & (1,3). Due the same for all states due to zero counts.
State × Rent/housing	5*5	16	6 - Keep (1,1), (1,2), & (2,*). Drop remainder due to zero counts.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	7 - Drop (4,1) due to zero counts.
Rent/housing × %Hispanic	3*5	8	All levels present.
Three-Factor Effects		128	5
State × %Owner × %Black	5*3*3	16	2 - Factor levels collapsed at lower order. Keep (1,3,2) & (1,2,2). Drop remainder due to zero counts.
State × %Owner × %Hispanic	5*3*3	16	1 - Keep (3,3,2). Factor levels collapsed at lower order. Drop remainder due to zero counts.
State × %Owner × Rent/house	5*3*5	32	2 - Factor levels collapsed at lower order. Keep (1,3,1) & (2,3,1). Drop remainder due to zero counts.
State × Rent/house × %Black	5*3*5	32	0 - Drop all due to zero counts.
State × Rent/house × %Hispanic	5*3*5	32	0 - Drop all due to zero counts.
Total		255	98

**Exhibit D9.2 Covariates for 2000 NHSDA Person Weights (res.sdu.ps)
Model Group 9: Pacific**

Variables	Level	Proposed	Final
One-Factor Effects		17	17
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		69	66
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	1 - Collapse (2,1) & (3,1).
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	All levels present.
State × Hispanicity	5*2	4	2 - Collapse (1,1), (2,1), & (3,1).
State × Gender	5*2	4	All levels present.
Three-Factor Effects		106	60
Age × Race(3) × Hispanicity	5*3*2	8	4 - Factor levels collapsed at lower order.
Age × Race(3) × Gender	5*3*2	8	4 - Factor levels collapsed at lower order.
Age × Hispanicity × Gender	5*2*2	4	4 - Factor levels collapsed at lower order.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Factor levels collapsed at lower order.
State × Age × Race(3 level)	5*5*3	32	16 - Factor levels collapsed at lower order.
State × Age × Hispanicity	5*5*2	16	8 - Factor levels collapsed at lower order.
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	1 - Factor levels collapsed at lower order. Drop (5,*,*) due to nonconv.
State × Race(3 level) × Gender	5*3*2	8	4 - Factor levels collapsed at lower order.
State × Hispanicity × Gender	5*2*2	4	2 - Factor levels collapsed at lower order.
Total		192	143

**Exhibit D9.3 Covariates for 2000 NHSDA Person Weights (sel.per.ps)
Model Group 9: Pacific**

Variables	Levels	Proposed	Final
One-Factor Effects		35	35
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	All levels present.
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		88	70
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	7 - Drop (4,1) due to zero counts.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	All levels present.
State × Hispanicity	5*2	4	All levels present.
State × Gender	5*2	4	All levels present.
State × %Black	5*3	8	4 - Collapse (5,1) & (5,2). Drop (1,1), (2,1), (3,1), due to zero counts.
State × %Hispanic	5*3	8	5 - Drop (1,1), (2,1) due to zero counts. Drop (5,1) due to exact lin. comb.
State × %Owner-occupied	5*3	8	All levels present.
State × Rent/housing	5*5	16	5 - Drop (1,4), (3,*) due to zero counts. Drop (1,3), (2,*) to collapse with reference. Drop (5,1) due to sing.
Three-Factor Effects		84	61
Age × Race(3) × Hispanicity	5*3*2	8	4 - Collapse (4,2,1) with reference. Drop (3,2,1) & (2,*,1) due to nonconv.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	5*5*3	32	16 - Drop (3,*,*) due to zero counts. Collapse (2,1,2) & (2,1,3). Do the same for each level of age in States (1) & (2).
State × Age × Hispanicity	5*5*2	16	All levels present.
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	4 - Drop (3,*,1) due to nonconv. Collapse (1,2,1) & (1,3,1). Do the same for State (2).
State × Race(3 level) × Gender	5*3*2	8	5 - Drop (3,*,1) & (2,*,1) due to nonconv.
State × Hispanicity × Gender	5*2*2	4	All levels present.
Total		282	236

**Exhibit D9.4 Covariates for 2000 NHSDA Person Weights (res.per.nr)
Model Group 9: Pacific**

Variables	Levels	Proposed	Final
One-Factor Effects		35	34
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Relation to Householder	4	3	All levels present.
Population Density	4	3	All levels present.
Group Quarter	3	2	1 - Collapse (1) & (2).
%Black	3	2	All levels present.
%Hispanic	3	2	All levels present.
%Owner-occupied	3	2	All levels present.
Rent/house Value	5	4	All levels present.
Two-Factor Effects		141	122
Age × Race(3)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3) × Hispanicity	3*2	2	All levels present.
Race(3) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
%Owner × %Black	3*3	4	All levels present.
%Owner × %Hispanic	3*3	4	All levels present.
%Owner × Rent/housing	3*5	8	All levels present.
Rent/housing × %Black	3*5	8	7 - Drop (4,1) due to zero counts.
Rent/housing × %Hispanic	3*5	8	All levels present.
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	11 - Collapse (3,2) & (3,3).
State × Hispanicity	5*2	4	All levels present.
State × Gender	5*2	4	All levels present.
State × %Black	5*3	8	5 - Drop (1,1) due to zero counts. Do the same for states (2) & (3).
State × %Hispanic	5*3	8	5 - Drop (1,1) due to zero counts. Do the same for states (2) & (3).
State × %Owner-occupied	5*3	8	All levels present.
State × Rent/housing	5*5	16	5 - Drop (2,*), (3,*) to collapse with reference. Drop (1,3), (1,4), & (5,1) due to zero counts.
Three-Factor Effects		106	56
Age × Race(3) × Hispanicity	5*3*2	8	4 - Collapse (1,2,1) & (1,3,1). Do the same for all levels of age.
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	1 - Collapse (2,1,1) & (3,1,1).
State × Age × Race(3 level)	5*5*3	32	8 - Drop (1,*,*), (2,*,*), & (3,*,*).
State × Age × Hispanicity	5*5*2	16	4 - Drop (1,*,*), (2,*,*), & (3,*,*).
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	2 - Drop (1,*,*), (2,*,*), & (3,*,*).
State × Race(3 level) × Gender	5*3*2	8	5 - Drop (2,*,*). Collapse (3,2,1) & (3,3,1).
State × Hispanicity × Gender	5*2*2	4	All levels present.
Total		282	212

**Exhibit D9.5 Covariates for 2000 NHSDA Person Weights (res.per.ps)
Model Group 9: Pacific**

Variables	Level	Proposed	Final
One-Factor Effects		17	17
Intercept	1	1	All levels present.
State	5	4	All levels present.
Quarter	4	3	All levels present.
Age	5	4	All levels present.
Race(4 level)	4	3	All levels present.
Gender	2	1	All levels present.
Hispanicity	2	1	All levels present.
Two-Factor Effects		69	67
Age × Race(3 level)	5*3	8	All levels present.
Age × Hispanicity	5*2	4	All levels present.
Age × Gender	5*2	4	All levels present.
Race(3 level) × Hispanicity	3*2	2	All levels present.
Race(3 level) × Gender	3*2	2	All levels present.
Hispanicity × Gender	2*2	1	All levels present.
State × Quarter	5*4	12	All levels present.
State × Age	5*5	16	All levels present.
State × Race(4 level)	5*4	12	10 - Collapse (3,2), (3,3), & (3,4).
State × Hispanicity	5*2	4	All levels present.
State × Gender	5*2	4	All levels present.
Three-Factor Effects		106	87
Age × Race(3) × Hispanicity	5*3*2	8	6 - Drop (4*,1).
Age × Race(3) × Gender	5*3*2	8	All levels present.
Age × Hispanicity × Gender	5*2*2	4	All levels present.
Race3 × Hispanicity × Gender	3*2*2	2	All levels present.
State × Age × Race(3 level)	5*5*3	32	24 - Factor levels collapsed at lower order. Drop (2,3,*), (2,4,*), (3,3,*) & (3,4,*).
State × Age × Hispanicity	5*5*2	16	15 - Drop (1,4,1).
State × Age × Gender	5*5*2	16	All levels present.
State × Race(3 level) × Hispanicity	5*3*2	8	3 - Keep (5,*,1). Factor levels collapsed at lower order.
State × Race(3 level) × Gender	5*3*2	8	5 - Factor levels collapsed at lower order. Drop (2,*,1).
State × Hispanicity × Gender	5*2*2	4	All levels present.
Total		192	171

Appendix E

Evaluation of Calibration Weights: Response Rates

Table E 2000 NHSDA Weighted Response Rates: United States, District of Columbia, and the 50 States

Domain	Dwelling Unit					Person Level		Interview Response Rate	
	Selected DUs	Eligible DUs	Completed DUs	Eligibility Rate	Screening Rate	Selected Persons	Respondents	Weight 1-10 ¹	Weight 1-11 ²
United States	215,860	182,576	169,769	84.91%	92.84%	91,961	71,764	73.93%	73.89%
Alabama	2,763	2,223	2,132	80.41%	95.50%	1,129	936	77.98%	78.80%
Alaska	2,272	1,718	1,640	73.63%	95.43%	1,024	833	80.24%	79.31%
Arizona	2,550	2,134	1,986	83.22%	92.99%	1,187	927	73.78%	73.31%
Arkansas	2,807	2,276	2,215	81.55%	97.19%	1,138	960	81.00%	80.60%
California	17,643	15,764	14,349	88.71%	90.99%	6,609	5,022	69.50%	69.54%
Colorado	2,459	2,151	2,041	87.88%	94.84%	1,216	911	75.26%	74.52%
Connecticut	3,087	2,795	2,509	90.37%	89.83%	1,275	891	71.36%	71.51%
Delaware	2,463	2,139	1,988	86.95%	92.91%	1,258	928	68.25%	67.86%
District of Columbia	4,004	3,276	3,064	81.98%	93.50%	1,082	918	85.56%	84.73%
Florida	10,887	8,510	8,038	78.23%	94.64%	4,308	3,478	75.73%	74.88%
Georgia	4,148	3,573	3,330	85.48%	92.95%	1,453	1,145	69.76%	69.59%
Hawaii	2,417	2,037	1,892	84.01%	91.95%	1,182	945	78.45%	77.59%
Idaho	2,222	1,840	1,725	82.91%	93.94%	1,177	894	74.45%	75.11%
Illinois	10,983	9,479	8,406	85.93%	88.71%	5,200	3,660	65.59%	66.04%
Indiana	3,843	3,333	3,088	86.21%	92.62%	1,394	1,061	73.87%	73.53%
Iowa	2,454	2,168	2,055	88.33%	94.78%	1,147	921	80.00%	79.76%
Kansas	2,283	1,965	1,815	86.24%	92.28%	1,199	897	73.45%	72.48%
Kentucky	2,817	2,406	2,306	85.53%	95.79%	1,200	1,018	84.14%	84.18%
Louisiana	2,487	2,013	1,922	80.79%	95.04%	1,130	939	80.81%	80.95%
Maine	3,230	2,479	2,292	76.50%	92.39%	1,110	901	78.46%	78.63%
Maryland	2,406	2,121	2,014	88.37%	94.88%	1,160	967	76.88%	76.89%
Massachusetts	3,661	3,236	2,909	87.88%	89.77%	1,435	1,002	66.45%	66.25%
Michigan	10,659	8,870	8,260	82.88%	93.19%	4,707	3,576	73.18%	73.41%
Minnesota	2,283	2,006	1,899	88.27%	94.66%	1,104	893	80.62%	80.09%
Mississippi	2,409	2,011	1,883	83.61%	93.60%	1,105	917	79.14%	79.45%

(Continued)

¹ Includes DU-level and person-level design weights, DU nonresponse adjustment, and DU poststratification.² Includes a selected person poststratification weight.

Table E 2000 NHSDA Weighted Response Rates: United States, District of Columbia, and the 50 States (continued)

Domain	Dwelling Unit					Person Level		Interview Response Rate	
	Selected DUs	Eligible DUs	Completed DUs	Eligibility Rate	Screening Rate	Selected Persons	Respondents	Weight 1-10 ¹	Weight 1-11 ²
Missouri	3,185	2,725	2,518	85.71%	92.25%	1,238	893	70.80%	70.72%
Montana	2,547	1,934	1,836	75.41%	94.91%	1,129	914	80.21%	79.85%
Nebraska	2,349	1,986	1,846	85.13%	93.13%	1,171	906	74.58%	74.35%
Nevada	2,257	1,960	1,800	86.60%	92.08%	1,188	925	74.44%	74.78%
New Hampshire	2,674	2,192	2,030	79.70%	92.41%	1,183	883	75.12%	74.97%
New Jersey	4,649	4,086	3,762	86.50%	91.96%	1,638	1,200	66.56%	65.62%
New Mexico	2,488	1,918	1,868	77.69%	97.43%	1,061	874	80.80%	80.52%
New York	11,424	9,798	8,709	85.65%	88.78%	4,732	3,589	73.73%	73.74%
North Carolina	3,738	3,180	3,008	84.93%	94.51%	1,342	1,043	73.19%	73.55%
North Dakota	2,459	2,038	1,921	82.43%	94.43%	1,116	896	79.46%	79.04%
Ohio	10,285	8,969	8,506	87.14%	94.89%	4,651	3,678	75.79%	76.15%
Oklahoma	2,438	2,069	1,919	84.70%	93.06%	1,257	973	74.85%	73.92%
Oregon	2,409	2,029	1,864	84.07%	91.87%	1,069	864	73.91%	75.08%
Pennsylvania	12,528	10,655	10,082	84.28%	94.37%	5,117	3,997	73.50%	73.67%
Rhode Island	2,760	2,400	2,189	87.03%	91.26%	1,269	950	74.11%	74.01%
South Carolina	2,468	2,080	1,974	84.38%	94.69%	1,101	855	77.84%	77.24%
South Dakota	2,255	1,850	1,759	82.24%	95.15%	1,077	855	76.67%	76.87%
Tennessee	3,008	2,578	2,329	85.84%	90.25%	1,172	947	72.45%	73.09%
Texas	9,978	8,487	8,043	84.85%	94.72%	4,884	4,020	78.12%	77.76%
Utah	1,748	1,519	1,441	86.91%	95.11%	1,234	1,031	83.44%	83.48%
Vermont	3,047	2,314	2,148	73.64%	92.62%	1,200	981	80.80%	80.67%
Virginia	3,668	3,160	2,885	86.42%	91.44%	1,322	1,047	75.18%	75.50%
Washington	3,257	2,746	2,575	83.20%	93.59%	1,244	1,006	75.45%	75.73%
West Virginia	3,151	2,569	2,443	81.32%	95.19%	1,176	950	78.17%	77.74%
Wisconsin	3,771	3,193	3,010	82.93%	94.33%	1,424	1,119	75.06%	75.02%
Wyoming	2,082	1,618	1,546	76.73%	95.41%	1,037	828	76.61%	76.52%

¹ Includes DU-level and person-level design weights, DU nonresponse adjustment, and DU poststratification.² Includes a selected person poststratification weight.

Appendix F

Evaluation of Calibration Weights: DU-Level Proportions of Extreme Values and Outwinsors

Table F 2000 NHSDA DU-Level Proportions of Extreme Values and Outwinors: United States, District of Columbia, and the 50 States

Domain	n	Before nr ¹ (Weight1*...*Weight6)			After nr & Before ps ² (Weight1*...*Weight7)			After ps (Weight1*...*Weight8)		
		Unweighted	Weighted ³	Outwinor ⁴	Unweighted	Weighted ³	Outwinor ⁴	Unweighted	Weighted ³	Outwinor ⁴
United States	169,769	4.60%	7.10%	1.22%	4.60%	7.10%	1.22%	1.76%	3.89%	0.81%
Alabama	2,132	9.66%	15.48%	0.91%	9.66%	15.48%	0.91%	5.16%	8.65%	1.47%
Alaska	1,640	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.59%	3.59%	0.46%
Arizona	1,986	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.81%	1.63%	0.14%
Arkansas	2,215	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.32%	0.84%	0.14%
California	14,349	9.59%	15.22%	3.99%	9.59%	15.22%	3.99%	3.32%	6.39%	1.32%
Colorado	2,041	1.27%	3.25%	0.51%	1.27%	3.25%	0.51%	1.71%	4.23%	0.44%
Connecticut	2,509	0.20%	0.01%	0.05%	0.20%	0.01%	0.05%	3.27%	5.54%	1.14%
Delaware	1,988	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	1.61%	0.23%
District of Columbia	3,064	3.95%	4.23%	0.43%	3.95%	4.23%	0.43%	1.04%	3.45%	0.77%
Florida	8,038	3.05%	3.02%	0.38%	3.05%	3.02%	0.38%	0.46%	0.91%	0.15%
Georgia	3,330	8.86%	11.27%	3.00%	8.86%	11.27%	3.00%	1.05%	2.23%	0.29%
Hawaii	1,892	12.26%	18.70%	5.47%	12.26%	18.70%	5.47%	0.79%	2.23%	0.35%
Idaho	1,725	15.65%	23.29%	3.00%	15.65%	23.29%	3.00%	0.29%	0.57%	0.06%
Illinois	8,406	0.46%	0.48%	0.03%	0.46%	0.48%	0.03%	1.68%	2.75%	0.42%
Indiana	3,088	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	3.12%	0.48%
Iowa	2,055	7.35%	6.73%	0.54%	7.35%	6.73%	0.54%	3.84%	5.00%	1.12%
Kansas	1,815	13.33%	22.92%	1.81%	13.33%	22.92%	1.81%	2.09%	3.88%	0.28%
Kentucky	2,306	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.52%	0.65%	0.06%
Louisiana	1,922	1.93%	2.17%	0.12%	1.93%	2.17%	0.12%	3.23%	5.84%	0.92%
Maine	2,292	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.05%	2.38%	0.18%
Maryland	2,014	15.29%	24.60%	3.82%	15.29%	24.60%	3.82%	13.80%	22.89%	3.63%
Massachusetts	2,909	8.59%	8.93%	0.84%	8.59%	8.93%	0.84%	1.86%	2.70%	0.49%
Michigan	8,260	0.54%	0.87%	0.28%	0.54%	0.87%	0.28%	1.66%	2.17%	0.43%
Minnesota	1,899	6.95%	7.89%	0.95%	6.95%	7.89%	0.95%	2.37%	4.19%	0.83%
Mississippi	1,883	0.27%	0.02%	0.12%	0.27%	0.02%	0.12%	1.49%	2.41%	0.27%

(continued)

¹ NR: nonresponse adjustment;

² PS: poststratification adjustment;

³ Weighted extreme value proportion: $100 * \frac{\sum_k w_{ek}}{\sum_k w_k}$, where w_{ek} denotes the weight for extreme values and w_k denotes the weight for both extreme values and non-extreme values;

⁴ Outwinor weight proportion: $100 * \frac{\sum_k (w_{ek} - b_k)}{\sum_k w_k}$, where b_k denotes the winsorized weight.

Table F 2000 NHSDA DU-Level Proportions of Extreme Values and Outwinors: United States, District of Columbia, and the 50 States (continued)

Domain	n	Before nr ¹ (Weight1*...*Weight6)			After nr & Before ps ² (Weight1*...*Weight7)			After ps (Weight1*...*Weight8)		
		Unweighted	Weighted ³	Outwinor ⁴	Unweighted	Weighted ³	Outwinor ⁴	Unweighted	Weighted ³	Outwinor ⁴
Missouri	2,518	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.95%	0.81%	0.09%
Montana	1,836	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.65%	1.35%	0.20%
Nebraska	1,846	16.74%	23.73%	3.49%	16.74%	23.73%	3.49%	1.25%	2.36%	0.52%
Nevada	1,800	1.72%	1.73%	0.12%	1.72%	1.73%	0.12%	1.44%	3.25%	0.60%
New Hampshire	2,030	0.89%	2.69%	1.21%	0.89%	2.69%	1.21%	1.33%	3.67%	1.20%
New Jersey	3,762	1.44%	3.62%	0.73%	1.44%	3.62%	0.73%	1.65%	4.25%	0.88%
New Mexico	1,868	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.07%	2.63%	0.39%
New York	8,709	0.34%	0.27%	0.00%	0.34%	0.27%	0.00%	1.73%	4.55%	1.45%
North Carolina	3,008	9.57%	10.28%	1.20%	9.57%	10.28%	1.20%	0.76%	1.11%	0.19%
North Dakota	1,921	12.18%	13.04%	0.93%	12.18%	13.04%	0.93%	0.99%	2.44%	0.78%
Ohio	8,506	5.85%	6.36%	0.98%	5.85%	6.36%	0.98%	1.32%	1.63%	0.24%
Oklahoma	1,919	15.48%	23.55%	2.07%	15.48%	23.55%	2.07%	1.82%	6.29%	1.54%
Oregon	1,864	15.93%	23.85%	2.53%	15.93%	23.85%	2.53%	1.39%	3.26%	0.69%
Pennsylvania	10,082	0.15%	0.50%	0.09%	0.15%	0.50%	0.09%	0.37%	1.12%	0.33%
Rhode Island	2,189	1.74%	2.23%	0.02%	1.74%	2.23%	0.02%	1.55%	3.60%	0.67%
South Carolina	1,974	0.20%	0.07%	0.08%	0.20%	0.07%	0.08%	1.37%	2.43%	0.32%
South Dakota	1,759	3.18%	3.60%	0.16%	3.18%	3.60%	0.16%	2.56%	3.94%	0.61%
Tennessee	2,329	17.00%	23.98%	3.37%	17.00%	23.98%	3.37%	0.26%	0.53%	0.03%
Texas	8,043	6.38%	10.26%	1.12%	6.38%	10.26%	1.12%	2.57%	6.82%	1.91%
Utah	1,441	10.34%	27.71%	13.02%	10.34%	27.71%	13.02%	7.36%	22.74%	8.80%
Vermont	2,148	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.61%	0.92%	0.12%
Virginia	2,885	4.71%	5.63%	0.47%	4.71%	5.63%	0.47%	0.73%	1.48%	0.15%
Washington	2,575	5.32%	6.94%	0.71%	5.32%	6.94%	0.71%	1.09%	2.40%	0.31%
West Virginia	2,443	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.41%	1.06%	0.14%
Wisconsin	3,010	1.93%	2.76%	0.95%	1.93%	2.76%	0.95%	0.66%	1.74%	0.22%
Wyoming	1,546	17.53%	25.42%	6.71%	17.53%	25.42%	6.71%	2.72%	7.80%	1.33%

¹ NR: nonresponse adjustment;

² PS: poststratification adjustment;

³ Weighted extreme value proportion: $100 * \sum_k w_{ek} / \sum_k w_k$, where w_{ek} denotes the weight for extreme values and w_k denotes the weight for both extreme values and non-extreme values;

⁴ Outwinor weight proportion: $100 * \sum_k (w_{ek} - b_k) / \sum_k w_k$, where b_k denotes the winsorized weight.

Appendix G

Evaluation of Calibration Weights: Person-Level Proportions of Extreme Values and Outwinsors

Table G.1 2000 NHSDA (Selected) Person-Level Proportions of Extreme Values and Outwinors: United States, District of Columbia, and the 50 States

Domain	n	Before sel.per.ps ¹			After sel.per.ps ¹		
		(Weight1*...*Weight10)			(Weight1*...*Weight11)		
		Unweighted	Weighted ²	Outwinor ³	Unweighted	Weighted ²	Outwinor ³
United States	91,961	3.57%	8.43%	2.01%	2.04%	4.46%	0.92%
Alabama	1,129	8.41%	19.24%	5.09%	3.01%	6.40%	0.86%
Alaska	1,024	2.73%	5.97%	0.90%	0.68%	1.61%	0.16%
Arizona	1,187	3.29%	6.44%	1.53%	0.84%	1.58%	0.30%
Arkansas	1,138	3.69%	3.47%	0.70%	0.53%	1.05%	0.24%
California	6,609	5.17%	12.84%	2.96%	3.63%	7.45%	1.86%
Colorado	1,216	3.13%	6.57%	1.28%	1.73%	2.06%	0.32%
Connecticut	1,275	4.47%	7.28%	1.51%	3.45%	7.08%	1.79%
Delaware	1,258	2.94%	7.58%	1.16%	1.19%	2.29%	0.52%
District of Columbia	1,082	2.96%	8.49%	1.93%	2.13%	5.80%	0.87%
Florida	4,308	2.99%	8.28%	2.53%	1.86%	3.37%	0.46%
Georgia	1,453	2.34%	7.80%	0.76%	1.17%	1.58%	0.24%
Hawaii	1,182	4.06%	12.71%	5.65%	3.47%	9.56%	2.97%
Idaho	1,177	2.29%	5.74%	1.02%	1.27%	1.82%	0.37%
Illinois	5,200	3.90%	6.37%	1.24%	2.46%	3.61%	0.53%
Indiana	1,394	3.01%	7.51%	1.84%	3.08%	5.72%	1.57%
Iowa	1,147	7.06%	15.78%	3.01%	1.83%	2.03%	0.53%
Kansas	1,199	3.42%	7.63%	1.36%	2.75%	11.10%	2.31%
Kentucky	1,200	2.58%	9.13%	1.72%	1.92%	3.20%	0.62%
Louisiana	1,130	3.72%	5.62%	1.25%	2.48%	6.84%	1.81%
Maine	1,110	1.53%	4.16%	0.78%	0.63%	1.23%	0.12%
Maryland	1,160	6.98%	21.62%	3.37%	2.33%	3.92%	0.39%
Massachusetts	1,435	2.93%	4.27%	0.86%	2.37%	4.91%	1.05%
Michigan	4,707	6.61%	9.17%	2.36%	3.57%	4.38%	0.64%
Minnesota	1,104	5.71%	9.91%	2.02%	3.08%	4.43%	1.28%
Mississippi	1,105	2.35%	5.15%	0.74%	0.81%	1.55%	0.20%

(continued)

¹ Before sel.per.ps(Weight1*...*Weight10), after sel.per.ps(Weight1*...*Weight11) used demographic variables from screener data for all selected persons.

² Weighted extreme value proportion: $100 * \sum_k w_{ek} / \sum_k w_k$, where w_{ek} denotes the weight for extreme values and w_k denotes the weight for both extreme values and non-extreme values.

³ Outwinor weight proportion: $100 * \sum_k (w_{ek} - b_k) / \sum_k w_k$, where b_k denotes the winsorized weight.

Table G.1 2000 NHSDA (Selected) Person-Level Proportions of Extreme Values and Outwinors: United States, District of Columbia, and the 50 States (continued)

Domain	n	Before sel.per.ps ¹			After sel.per.ps ¹		
		(Weight1*...*Weight10)			(Weight1*...*Weight11)		
		Unweighted	Weighted ²	Outwinor ³	Unweighted	Weighted ²	Outwinor ³
Missouri	1,238	3.07%	5.30%	0.89%	1.37%	2.89%	0.77%
Montana	1,129	2.92%	8.40%	1.28%	0.97%	2.18%	0.50%
Nebraska	1,171	4.44%	8.83%	2.02%	2.99%	5.16%	1.03%
Nevada	1,188	3.70%	9.48%	2.16%	1.26%	4.11%	1.00%
New Hampshire	1,183	1.01%	1.01%	0.10%	0.93%	1.43%	0.39%
New Jersey	1,638	1.83%	4.16%	0.89%	2.14%	7.80%	1.50%
New Mexico	1,061	3.11%	7.19%	1.44%	2.64%	5.72%	1.45%
New York	4,732	3.44%	7.91%	2.54%	1.86%	5.63%	0.95%
North Carolina	1,342	1.19%	1.57%	0.26%	1.04%	1.26%	0.24%
North Dakota	1,116	2.87%	6.12%	1.71%	0.45%	0.94%	0.09%
Ohio	4,651	3.85%	12.37%	1.57%	1.42%	2.30%	0.33%
Oklahoma	1,257	1.91%	6.51%	1.77%	2.39%	6.03%	1.25%
Oregon	1,069	5.14%	12.09%	5.05%	2.90%	3.96%	0.79%
Pennsylvania	5,117	1.76%	3.41%	0.88%	1.00%	2.27%	0.47%
Rhode Island	1,269	3.47%	8.06%	1.96%	2.44%	4.87%	1.74%
South Carolina	1,101	1.73%	4.75%	1.28%	1.09%	1.68%	0.28%
South Dakota	1,077	3.71%	6.20%	1.46%	1.86%	3.53%	0.47%
Tennessee	1,172	5.12%	13.89%	5.05%	4.52%	12.93%	3.11%
Texas	4,884	3.58%	11.91%	3.62%	2.15%	5.14%	1.09%
Utah	1,234	2.92%	6.60%	1.62%	3.24%	7.05%	1.68%
Vermont	1,200	2.83%	6.92%	1.00%	0.42%	0.62%	0.07%
Virginia	1,322	1.44%	4.62%	0.91%	0.91%	1.05%	0.16%
Washington	1,244	1.05%	2.68%	0.47%	1.05%	2.43%	0.55%
West Virginia	1,176	3.74%	6.49%	1.34%	0.60%	1.92%	0.28%
Wisconsin	1,424	0.98%	1.80%	0.37%	0.84%	2.11%	0.16%
Wyoming	1,037	5.21%	12.32%	3.26%	1.93%	2.28%	0.61%

¹ Before sel.per.ps(Weight1*...*Weight10), after sel.per.ps(Weight1*...*Weight11) used demographic variables from screener data for all selected persons.

² Weighted extreme value proportion: $100 * \sum_k w_{ek} / \sum_k w_k$, where w_{ek} denotes the weight for extreme values and w_k denotes the weight for both extreme values and non-extreme values.

³ Outwinor weight proportion: $100 * \sum_k (w_{ek} - b_k) / \sum_k w_k$, where b_k denotes the winsorized weight.

Table G2 2000 NHSDA (Respondent) Person-Level Proportions of Extreme Values and Outwinsors: United States, District of Columbia and the 50 States

Domain	n	res.per.nr ¹						res.per.ps ²					
		Before(Weight1*...*Weight11)			After(Weight1*...*Weight12)			Before(Weight1*...*Weight12)			Final Weight After(Weight1*...*Weight13)		
		Unweighted	Weighted ³	Outwinsor ⁴	Unweighted	Weighted ³	Outwinsor ⁴	Unweighted	Weighted ³	Outwinsor ⁴	Unweighted	Weighted ³	Outwinsor ⁴
United States	71,764	2.12%	4.63%	0.97%	1.76%	4.24%	0.76%	1.88%	4.69%	0.89%	1.17%	2.18%	0.42%
Alabama	936	2.35%	4.89%	0.61%	1.82%	5.33%	1.70%	1.92%	5.67%	1.70%	1.60%	5.73%	0.83%
Alaska	833	0.84%	2.04%	0.22%	1.80%	4.19%	0.94%	1.80%	4.19%	0.96%	0.24%	0.31%	0.08%
Arizona	927	0.86%	1.92%	0.40%	1.73%	2.29%	0.44%	1.94%	2.78%	0.60%	0.00%	0.00%	0.00%
Arkansas	960	0.42%	0.45%	0.15%	0.63%	2.44%	0.40%	0.83%	2.86%	0.61%	0.73%	0.71%	0.15%
California	5,022	3.54%	8.27%	2.01%	3.27%	7.44%	1.29%	3.42%	7.84%	1.38%	1.95%	1.76%	0.34%
Colorado	911	1.76%	2.28%	0.40%	0.66%	1.60%	0.15%	0.77%	1.79%	0.22%	0.55%	0.59%	0.12%
Connecticut	891	3.93%	8.14%	1.92%	1.23%	6.24%	1.64%	1.46%	7.20%	1.88%	2.24%	3.77%	0.55%
Delaware	928	1.51%	2.89%	0.71%	1.40%	4.84%	0.46%	1.08%	3.46%	0.32%	0.32%	0.75%	0.05%
District of Columbia	918	2.61%	6.43%	0.99%	2.72%	6.49%	1.00%	2.83%	7.00%	1.24%	1.53%	4.82%	0.84%
Florida	3,478	1.87%	2.55%	0.36%	1.35%	2.75%	0.32%	1.61%	3.33%	0.52%	0.83%	1.39%	0.19%
Georgia	1,145	1.40%	2.87%	0.38%	3.67%	8.85%	0.67%	3.49%	9.58%	1.13%	1.75%	1.32%	0.16%
Hawaii	945	3.39%	9.34%	3.28%	3.81%	9.00%	3.04%	3.70%	8.53%	2.78%	2.75%	3.99%	1.02%
Idaho	894	1.34%	2.19%	0.46%	0.56%	0.72%	0.23%	0.56%	0.72%	0.23%	0.78%	1.58%	0.42%
Illinois	3,660	2.62%	4.11%	0.64%	1.37%	3.24%	0.43%	1.50%	3.63%	0.58%	0.46%	1.41%	0.20%
Indiana	1,061	3.39%	6.73%	1.76%	5.18%	8.32%	1.75%	5.18%	7.93%	1.66%	3.77%	6.21%	2.15%
Iowa	921	2.06%	2.59%	0.44%	0.65%	1.41%	0.40%	0.87%	1.81%	0.44%	0.98%	1.97%	0.78%
Kansas	897	2.68%	10.43%	1.52%	2.79%	8.29%	1.38%	2.79%	8.29%	1.37%	1.78%	6.68%	2.54%
Kentucky	1,018	1.67%	3.29%	0.71%	2.46%	3.97%	0.62%	2.55%	4.04%	0.63%	0.59%	0.70%	0.07%
Louisiana	939	2.45%	6.83%	1.72%	2.77%	7.81%	1.37%	2.77%	7.81%	1.43%	0.96%	1.70%	0.34%
Maine	901	0.22%	1.07%	0.15%	0.11%	0.12%	0.01%	0.11%	0.12%	0.01%	0.22%	0.08%	0.01%
Maryland	967	2.07%	3.13%	0.31%	0.21%	0.97%	0.03%	0.31%	1.12%	0.11%	0.21%	0.38%	0.04%
Massachusetts	1,002	2.79%	4.12%	0.72%	3.39%	4.88%	0.75%	3.59%	5.43%	0.95%	1.50%	3.31%	0.50%
Michigan	3,576	3.97%	5.13%	0.68%	1.45%	1.87%	0.20%	1.73%	2.21%	0.34%	1.90%	1.87%	0.32%
Minnesota	893	3.02%	4.48%	1.29%	2.58%	4.28%	0.96%	2.69%	4.81%	1.16%	1.46%	2.87%	0.65%
Mississippi	917	0.65%	1.56%	0.15%	1.85%	4.77%	0.85%	1.85%	4.99%	0.87%	0.00%	0.00%	0.00%

(continued)

¹ Before res.per.nr.(Weight1*...*Weight11), after res.per.nr.(Weight1*...*Weight12) used demographic variables from screener data for all respondents.

² Before res.per.ps(Weight1*...*Weight12), after res.per.ps(Weight1*...*Weight13) used demographic variables from questionnaire data for all respondents.

³ Weighted outlier proportion: $100 * \sum_k w_{ok} / \sum_k w_k$, where w_{ok} denotes the weight for outliers and w_k denotes the weight for both outliers and non-outliers.

⁴ Outwinsor weight proportion: $100 * \sum_k (w_{ok} - b_k) / \sum_k w_k$, where b_k denotes the winsorized weight.

Table G2 2000 NHSDA (Respondent) Person-Level Proportions of Extreme Values and Outwinsors: United States, District of Columbia and the 50 States (continued)

Domain	n	res.per.nr ¹						res.per.ps ²					
		Before(Weight1*...*Weight11)			After(Weight1*...*Weight12)			Before(Weight1*...*Weight12)			Final Weight After(Weight1*...*Weight13)		
		Unweighted	Weighted ³	Outwinsor ⁴	Unweighted	Weighted ³	Outwinsor ⁴	Unweighted	Weighted ³	Outwinsor ⁴	Unweighted	Weighted ³	Outwinsor ⁴
Missouri	893	1.23%	3.19%	0.81%	1.12%	2.50%	0.76%	1.23%	2.82%	0.99%	0.78%	1.79%	0.30%
Montana	914	1.53%	4.47%	0.61%	0.77%	1.85%	0.49%	0.98%	2.30%	0.74%	0.77%	1.90%	0.42%
Nebraska	906	3.86%	6.28%	1.28%	2.98%	8.45%	2.71%	3.20%	8.97%	2.83%	1.43%	2.45%	0.94%
Nevada	925	1.08%	4.28%	0.97%	0.76%	1.83%	0.43%	0.76%	1.57%	0.39%	0.76%	1.18%	0.37%
New Hampshire	883	1.13%	1.73%	0.48%	0.79%	1.88%	0.53%	0.79%	1.88%	0.75%	0.11%	0.14%	0.01%
New Jersey	1,200	1.83%	5.54%	1.09%	0.42%	0.48%	0.06%	0.67%	2.11%	0.10%	1.08%	5.83%	0.31%
New Mexico	874	2.86%	5.72%	1.68%	2.29%	5.71%	1.68%	2.63%	6.46%	1.63%	1.14%	2.33%	0.42%
New York	3,589	2.03%	6.43%	1.13%	1.20%	2.56%	0.24%	1.28%	2.86%	0.36%	0.95%	2.12%	0.22%
North Carolina	1,043	1.05%	1.13%	0.15%	1.53%	2.90%	0.33%	1.63%	3.21%	0.44%	0.29%	0.41%	0.06%
North Dakota	896	0.89%	1.71%	0.19%	2.23%	3.86%	1.48%	2.23%	3.86%	1.48%	1.00%	2.42%	0.61%
Ohio	3,678	1.50%	2.37%	0.33%	0.63%	1.39%	0.22%	0.73%	1.68%	0.36%	0.54%	0.79%	0.11%
Oklahoma	973	2.47%	6.63%	1.49%	2.36%	5.72%	0.99%	2.16%	5.51%	1.07%	1.13%	2.27%	0.57%
Oregon	864	3.94%	6.53%	1.17%	3.13%	3.05%	0.63%	3.70%	5.64%	0.69%	1.16%	2.40%	0.83%
Pennsylvania	3,997	0.98%	2.24%	0.56%	1.55%	3.91%	0.42%	1.60%	3.66%	0.42%	0.55%	1.09%	0.25%
Rhode Island	950	2.63%	5.22%	1.83%	1.37%	5.44%	1.34%	1.37%	5.44%	1.32%	2.21%	7.18%	1.45%
South Carolina	855	0.94%	0.97%	0.17%	0.82%	1.20%	0.11%	0.82%	1.26%	0.12%	0.35%	0.51%	0.01%
South Dakota	855	1.40%	3.27%	0.52%	1.05%	3.03%	0.64%	1.05%	3.03%	0.61%	1.64%	3.11%	0.79%
Tennessee	947	4.44%	12.34%	3.84%	5.17%	18.66%	5.29%	5.28%	20.16%	5.86%	3.06%	9.24%	1.79%
Texas	4,020	2.24%	5.67%	1.20%	1.89%	4.35%	0.73%	2.09%	5.63%	1.04%	0.87%	1.18%	0.26%
Utah	1,031	3.98%	8.47%	2.16%	2.23%	5.79%	1.32%	2.13%	5.39%	1.31%	6.60%	16.29%	3.37%
Vermont	981	0.51%	0.77%	0.06%	0.71%	1.23%	0.26%	0.92%	1.51%	0.47%	0.41%	1.80%	0.27%
Virginia	1,047	0.96%	0.98%	0.19%	0.86%	2.11%	0.38%	0.96%	2.39%	0.55%	1.15%	1.21%	0.29%
Washington	1,006	1.09%	3.00%	0.64%	0.99%	1.61%	0.31%	1.29%	2.44%	0.50%	1.19%	1.21%	0.13%
West Virginia	950	0.84%	2.77%	0.32%	1.16%	2.74%	0.42%	1.05%	2.64%	0.39%	0.42%	0.68%	0.15%
Wisconsin	1,119	0.89%	1.55%	0.13%	0.63%	0.91%	0.15%	0.63%	0.91%	0.15%	0.98%	3.63%	1.16%
Wyoming	828	1.57%	2.09%	0.67%	3.38%	5.01%	1.19%	3.62%	5.65%	1.25%	2.05%	4.80%	0.80%

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¹ Before res.per.nr.(Weight1*...*Weight11), after res.per.nr.(Weight1*...*Weight12) used demographic variables from screener data for all respondents.

² Before res.per.ps(Weight1*...*Weight12), after res.per.ps(Weight1*...*Weight13) used demographic variables from questionnaire data for all respondents.

³ Weighted outlier proportion: $100 * \sum_k w_{ok} / \sum_k w_k$, where w_{ok} denotes the weight for outliers and w_k denotes the weight for both outliers and non-outliers.

⁴ Outwinsor weight proportion: $100 * \sum_k (w_{ok} - b_k) / \sum_k w_k$, where b_k denotes the winsorized weight.

Appendix H

Evaluation of Calibration Weights: Slippage Rates

Table H.1 2000 NHSDA Slippage Rates: United States

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		71,764	223,279,598	223,279,598	223,279,598	0.00	0.00
Quarter	Quarter 1	18,083	55,595,544	55,595,544	55,595,544	0.00	0.00
	Quarter 2	19,432	55,728,700	55,728,700	55,728,700	0.00	0.00
	Quarter 3	19,042	55,893,317	55,893,317	55,893,317	0.00	0.00
	Quarter 4	15,207	56,062,038	56,062,037	56,062,037	0.00	-0.00
Age Group	12-17	25,717	23,402,681	23,367,782	23,367,782	0.15	-0.00
	18-25	22,613	28,949,681	28,984,464	28,984,464	-0.12	0.00
	26-34	9,552	33,146,047	33,009,817	33,009,818	0.41	-0.00
	35-49	7,158	63,682,780	63,882,401	63,882,401	-0.31	0.00
	50+	6,724	74,098,408	74,035,133	74,035,133	0.09	0.00
Race	White	57,602	182,835,224	185,571,216	185,572,668	-1.48	-0.00
	Black	9,340	27,924,444	26,927,054	26,926,964	3.70	0.00
	Other	4,822	12,519,930	10,781,328	10,779,966	16.14	0.01
Hispanicity	Hispanic	9,393	23,696,741	23,847,195	23,847,195	-0.63	-0.00
	Non-Hispanic	62,371	199,582,857	199,432,403	199,432,403	0.08	0.00
Gender	Male	34,386	107,319,736	107,344,107	107,344,107	-0.02	0.00
	Female	37,378	115,959,862	115,935,491	115,935,491	0.02	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.2 2000 NHSDA Slippage Rates: Alabama

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		936	3,653,731	3,653,731	3,653,731	0.00	0.00
Quarter	Quarter 1	280	910,573	910,573	910,573	0.00	-0.00
	Quarter 2	299	912,185	912,185	912,185	0.00	0.00
	Quarter 3	238	914,352	914,352	914,352	0.00	0.00
	Quarter 4	119	916,620	916,620	916,620	0.00	0.00
Age Group	12-17	294	370,130	371,242	371,242	-0.30	0.00
	18-25	337	466,368	475,890	475,890	-2.00	0.00
	26-34	156	555,048	536,803	536,803	3.40	-0.00
	35-49	82	983,815	1,005,353	1,005,353	-2.14	0.00
	50+	67	1,278,370	1,264,443	1,264,443	1.10	-0.00
Race	White	647	2,741,645	2,726,667	2,726,667	0.55	0.00
	Black	268	869,643	884,811	884,811	-1.71	0.00
	Other	21	42,442	42,253	42,253	0.45	-0.00
Hispanicity	Hispanic	27	15,144	45,709	29,012	-47.80	57.55
	Non-Hispanic	909	3,638,587	3,608,022	3,624,718	0.38	-0.46
Gender	Male	445	1,694,098	1,722,530	1,722,530	-1.65	0.00
	Female	491	1,959,633	1,931,201	1,931,201	1.47	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.3 2000 NHSDA Slippage Rates: Alaska

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		833	490,815	490,815	490,815	-0.00	0.00
Quarter	Quarter 1	218	122,305	122,305	122,305	0.00	-0.00
	Quarter 2	237	122,548	122,548	122,548	0.00	-0.00
	Quarter 3	153	122,828	122,828	122,828	-0.00	-0.00
	Quarter 4	225	123,134	123,134	123,134	-0.00	0.00
Age Group	12-17	294	61,992	62,536	62,536	-0.87	-0.00
	18-25	257	72,234	71,435	71,435	1.12	-0.00
	26-34	86	74,123	74,978	74,978	-1.14	0.00
	35-49	126	161,702	160,176	160,176	0.95	0.00
	50+	70	120,765	121,690	121,690	-0.76	0.00
Race	White	592	380,161	375,999	375,999	1.11	-0.00
	Black	42	19,084	16,883	16,883	13.03	-0.00
	Other	199	91,571	97,933	97,933	-6.50	0.00
Hispanicity	Hispanic	46	17,645	20,590	20,590	-14.30	-0.00
	Non-Hispanic	787	473,171	470,225	470,225	0.63	0.00
Gender	Male	391	248,017	249,415	249,415	-0.56	-0.00
	Female	442	242,799	241,401	241,401	0.58	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.4 2000 NHSDA Slippage Rates: Arizona

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		927	3,865,531	3,865,531	3,865,531	-0.00	0.00
Quarter	Quarter 1	292	961,544	961,544	961,544	-0.00	0.00
	Quarter 2	214	964,504	964,504	964,504	0.00	-0.00
	Quarter 3	214	861,027	967,972	967,972	-11.05	0.00
	Quarter 4	207	1,078,457	971,512	971,512	11.01	0.00
Age Group	12-17	292	436,736	433,575	433,575	0.73	0.00
	18-25	303	509,556	516,212	516,212	-1.29	-0.00
	26-34	175	561,297	540,748	540,748	3.80	0.00
	35-49	95	1,005,756	1,044,093	1,044,093	-3.67	0.00
	50+	62	1,352,187	1,330,902	1,330,902	1.60	0.00
Race	White	800	3,386,316	3,465,108	3,465,108	-2.27	0.00
	Black	34	140,795	127,841	127,841	10.13	-0.00
	Other	93	338,420	272,582	272,582	24.15	0.00
Hispanicity	Hispanic	321	829,757	796,137	796,137	4.22	0.00
	Non-Hispanic	606	3,035,774	3,069,394	3,069,394	-1.10	0.00
Gender	Male	450	1,871,926	1,874,150	1,874,150	-0.12	0.00
	Female	477	1,993,605	1,991,381	1,991,381	0.11	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.5 2000 NHSDA Slippage Rates: Arkansas

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		960	2,159,485	2,159,485	2,159,485	0.00	-0.00
Quarter	Quarter 1	200	538,262	538,262	538,262	0.00	0.00
	Quarter 2	300	539,165	539,165	539,165	0.00	0.00
	Quarter 3	280	540,392	540,392	540,392	0.00	-0.00
	Quarter 4	180	541,667	541,667	541,667	0.00	0.00
Age Group	12-17	310	225,178	224,962	224,962	0.10	-0.00
	18-25	364	285,593	279,168	279,168	2.30	0.00
	26-34	69	277,173	293,033	293,033	-5.41	0.00
	35-49	87	578,755	569,536	569,536	1.62	0.00
	50+	130	792,785	792,785	792,785	0.00	0.00
Race	White	771	1,829,462	1,817,323	1,817,323	0.67	0.00
	Black	172	313,253	313,389	313,389	-0.04	-0.00
	Other	17	16,769	28,773	28,773	-41.72	0.00
Hispanicity	Hispanic	29	26,569	27,440	27,440	-3.17	-0.00
	Non-Hispanic	931	2,132,915	2,132,045	2,132,045	0.04	0.00
Gender	Male	448	1,031,356	1,027,790	1,027,790	0.35	0.00
	Female	512	1,128,128	1,131,695	1,131,695	-0.32	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.6 2000 NHSDA Slippage Rates: California

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		5,022	25,735,530	25,735,530	25,735,530	-0.00	0.00
Quarter	Quarter 1	1,328	6,390,002	6,390,002	6,390,002	0.00	0.00
	Quarter 2	1,310	6,417,353	6,417,353	6,417,353	-0.00	0.00
	Quarter 3	1,469	6,448,455	6,448,455	6,448,455	0.00	0.00
	Quarter 4	915	6,479,719	6,479,719	6,479,719	-0.00	0.00
Age Group	12-17	2,365	2,849,555	2,850,742	2,850,742	-0.04	0.00
	18-25	1,354	3,536,877	3,513,293	3,513,293	0.67	0.00
	26-34	678	4,102,324	4,211,020	4,211,020	-2.58	0.00
	35-49	410	7,660,937	7,592,193	7,592,193	0.91	0.00
	50+	215	7,585,836	7,568,282	7,568,282	0.23	-0.00
Race	White	3,793	19,255,768	20,286,243	20,286,243	-5.08	0.00
	Black	412	2,084,365	1,807,521	1,807,521	15.32	0.00
	Other	817	4,395,396	3,641,766	3,641,766	20.69	0.00
Hispanicity	Hispanic	2,148	7,795,709	7,862,738	7,862,738	-0.85	0.00
	Non-Hispanic	2,874	17,939,821	17,872,792	17,872,792	0.38	0.00
Gender	Male	2,454	12,630,290	12,626,177	12,626,177	0.03	0.00
	Female	2,568	13,105,240	13,109,353	13,109,353	-0.03	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.7 2000 NHSDA Slippage Rates: Colorado

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		911	3,410,846	3,410,846	3,410,846	0.00	0.00
Quarter	Quarter 1	219	849,496	849,496	849,496	0.00	0.00
	Quarter 2	302	851,427	851,427	851,427	0.00	0.00
	Quarter 3	216	853,763	853,763	853,763	0.00	0.00
	Quarter 4	174	856,161	856,161	856,161	0.00	0.00
Age Group	12-17	278	359,353	357,886	357,886	0.41	0.00
	18-25	298	453,964	452,366	452,366	0.35	0.00
	26-34	157	497,598	497,532	497,532	0.01	-0.00
	35-49	111	1,018,009	1,032,514	1,032,514	-1.40	0.00
	50+	67	1,081,922	1,070,549	1,070,549	1.06	0.00
Race	White	831	3,125,370	3,151,325	3,151,325	-0.82	0.00
	Black	34	147,225	142,734	142,734	3.15	0.00
	Other	46	138,251	116,787	116,787	18.38	0.00
Hispanicity	Hispanic	170	447,976	461,534	461,534	-2.94	0.00
	Non-Hispanic	741	2,962,870	2,949,312	2,949,312	0.46	0.00
Gender	Male	425	1,669,418	1,664,714	1,664,714	0.28	0.00
	Female	486	1,741,429	1,746,132	1,746,132	-0.27	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.8 2000 NHSDA Slippage Rates: Connecticut

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		891	2,700,927	2,700,927	2,700,927	0.00	-0.00
Quarter	Quarter 1	202	672,966	672,966	672,966	0.00	-0.00
	Quarter 2	243	674,279	674,279	674,279	0.00	-0.00
	Quarter 3	255	675,968	675,968	675,968	0.00	0.00
	Quarter 4	191	677,714	677,714	677,714	-0.00	-0.00
Age Group	12-17	299	256,606	256,501	256,501	0.04	0.00
	18-25	262	307,141	308,007	308,007	-0.28	0.00
	26-34	137	394,913	393,551	393,551	0.35	-0.00
	35-49	101	798,207	806,007	806,007	-0.97	0.00
	50+	92	944,060	936,861	936,861	0.77	0.00
Race	White	751	2,312,597	2,384,262	2,384,262	-3.01	-0.00
	Black	85	263,018	246,876	246,876	6.54	-0.00
	Other	55	125,312	69,789	69,789	79.56	-0.00
Hispanicity	Hispanic	130	230,485	217,085	217,085	6.17	-0.00
	Non-Hispanic	761	2,470,442	2,483,842	2,483,842	-0.54	-0.00
Gender	Male	428	1,305,165	1,295,132	1,295,132	0.77	-0.00
	Female	463	1,395,762	1,405,796	1,405,796	-0.71	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.9 2000 NHSDA Slippage Rates: Delaware

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		928	630,067	630,067	630,067	0.00	0.00
Quarter	Quarter 1	240	157,043	157,043	157,043	0.00	0.00
	Quarter 2	285	157,312	157,312	157,312	0.00	0.00
	Quarter 3	230	157,669	157,669	157,669	0.00	0.00
	Quarter 4	173	158,044	158,044	158,044	0.00	0.00
Age Group	12-17	321	64,886	64,748	64,748	0.21	0.00
	18-25	297	77,307	78,652	78,652	-1.71	0.00
	26-34	82	98,156	96,384	96,384	1.84	0.00
	35-49	92	180,021	184,130	184,130	-2.23	0.00
	50+	136	209,698	206,153	206,153	1.72	0.00
Race	White	672	494,920	501,895	501,895	-1.39	0.00
	Black	197	117,697	113,580	113,580	3.63	0.00
	Other	59	17,450	14,593	14,593	19.58	-0.00
Hispanicity	Hispanic	76	20,161	19,271	19,271	4.62	0.00
	Non-Hispanic	852	609,907	610,797	610,797	-0.15	0.00
Gender	Male	462	300,973	302,511	302,511	-0.51	0.00
	Female	466	329,095	327,556	327,556	0.47	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.10 2000 NHSDA Slippage Rates: District of Columbia

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		918	423,628	423,628	423,628	0.00	0.00
Quarter	Quarter 1	162	105,292	105,292	105,292	0.00	0.00
	Quarter 2	234	105,661	105,661	105,661	0.00	0.00
	Quarter 3	213	106,104	106,104	106,104	0.00	-0.00
	Quarter 4	309	106,572	106,572	106,572	0.00	-0.00
Age Group	12-17	259	43,346	43,956	43,956	-1.39	0.00
	18-25	340	59,313	58,255	58,255	1.82	0.00
	26-34	111	68,476	66,292	66,292	3.29	0.00
	35-49	95	116,990	116,368	116,368	0.54	-0.00
	50+	113	135,503	138,758	138,758	-2.35	-0.00
Race	White	320	146,878	155,856	155,856	-5.76	0.00
	Black	559	257,973	254,155	254,065	1.54	0.04
	Other	39	18,778	13,618	13,708	36.99	-0.66
Hispanicity	Hispanic	81	24,941	31,763	31,763	-21.48	0.00
	Non-Hispanic	837	398,687	391,865	391,865	1.74	-0.00
Gender	Male	399	195,553	192,954	192,954	1.35	0.00
	Female	519	228,075	230,674	230,674	-1.13	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.11 2000 NHSDA Slippage Rates: Florida

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		3,478	12,692,940	12,692,940	12,692,940	0.00	0.00
Quarter	Quarter 1	876	3,157,054	3,157,054	3,157,054	0.00	0.00
	Quarter 2	1,017	3,166,748	3,166,748	3,166,748	0.00	0.00
	Quarter 3	802	3,178,486	3,178,486	3,178,486	0.00	0.00
	Quarter 4	783	3,190,653	3,190,653	3,190,653	0.00	0.00
Age Group	12-17	1,194	1,182,348	1,178,088	1,178,088	0.36	0.00
	18-25	1,140	1,367,145	1,367,929	1,367,929	-0.06	0.00
	26-34	497	1,643,760	1,609,489	1,609,489	2.13	0.00
	35-49	329	3,329,875	3,379,355	3,379,355	-1.46	0.00
	50+	318	5,169,813	5,158,080	5,158,080	0.23	0.00
Race	White	2,681	10,555,845	10,698,630	10,698,630	-1.33	0.00
	Black	644	1,706,324	1,733,793	1,733,793	-1.58	0.00
	Other	153	430,771	260,518	260,518	65.35	-0.00
Hispanicity	Hispanic	817	1,983,125	1,991,308	1,991,308	-0.41	0.00
	Non-Hispanic	2,661	10,709,816	10,701,633	10,701,633	0.08	0.00
Gender	Male	1,723	6,080,366	6,026,353	6,026,353	0.90	0.00
	Female	1,755	6,612,574	6,666,587	6,666,587	-0.81	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.12 2000 NHSDA Slippage Rates: Georgia

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		1,145	6,354,109	6,354,109	6,354,109	0.00	0.00
Quarter	Quarter 1	292	1,583,538	1,583,538	1,583,538	-0.00	0.00
	Quarter 2	325	1,586,390	1,586,390	1,586,390	0.00	-0.00
	Quarter 3	323	1,590,127	1,590,127	1,590,127	0.00	0.00
	Quarter 4	205	1,594,055	1,594,055	1,594,055	0.00	-0.00
Age Group	12-17	520	676,924	679,915	679,915	-0.44	0.00
	18-25	330	885,952	862,755	862,755	2.69	-0.00
	26-34	150	1,052,800	1,010,634	1,010,634	4.17	0.00
	35-49	83	1,887,264	1,914,681	1,914,681	-1.43	-0.00
	50+	62	1,851,169	1,886,126	1,886,126	-1.85	-0.00
Race	White	782	4,487,924	4,480,142	4,480,142	0.17	-0.00
	Black	325	1,741,758	1,745,851	1,745,851	-0.23	0.00
	Other	38	124,427	128,115	128,115	-2.88	0.00
Hispanicity	Hispanic	146	164,435	140,404	140,404	17.12	-0.00
	Non-Hispanic	999	6,189,675	6,213,705	6,213,705	-0.39	0.00
Gender	Male	556	2,976,307	3,030,381	3,030,381	-1.78	0.00
	Female	589	3,377,802	3,323,728	3,323,728	1.63	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.13 2000 NHSDA Slippage Rates: Hawaii

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		945	974,704	974,704	974,704	0.00	0.00
Quarter	Quarter 1	237	241,303	241,303	241,303	0.00	0.00
	Quarter 2	295	242,774	242,774	242,774	0.00	-0.00
	Quarter 3	267	244,467	244,467	244,467	0.00	0.00
	Quarter 4	146	246,159	246,159	246,159	0.00	-0.00
Age Group	12-17	309	94,823	95,167	95,167	-0.36	-0.00
	18-25	307	112,923	115,158	115,158	-1.94	0.00
	26-34	89	144,592	140,449	140,449	2.95	0.00
	35-49	98	284,137	284,771	284,771	-0.22	0.00
	50+	142	338,228	339,159	339,159	-0.27	-0.00
Race	White	260	333,211	324,797	324,797	2.59	-0.00
	Black	25	8,936	15,895	15,895	-43.78	-0.00
	Other	660	632,556	634,011	634,011	-0.23	0.00
Hispanicity	Hispanic	123	161,365	70,276	70,276	129.61	0.00
	Non-Hispanic	822	813,339	904,427	904,427	-10.07	-0.00
Gender	Male	430	458,885	474,761	474,761	-3.34	-0.00
	Female	515	515,819	499,942	499,942	3.18	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.14 2000 NHSDA Slippage Rates: Idaho

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C% %
Total		894	1,083,235	1,083,235	1,083,235	0.00	-0.00
Quarter	Quarter 1	231	270,035	270,035	270,035	0.00	0.00
	Quarter 2	256	270,484	270,484	270,484	0.00	0.00
	Quarter 3	221	271,067	271,067	271,067	0.00	0.00
	Quarter 4	186	271,649	271,649	271,649	0.00	-0.00
Age Group	12-17	311	129,382	129,640	129,640	-0.20	-0.00
	18-25	283	164,106	164,745	164,745	-0.39	0.00
	26-34	71	150,764	151,311	151,311	-0.36	-0.00
	35-49	102	286,068	288,227	288,227	-0.75	0.00
	50+	127	352,916	349,313	349,313	1.03	-0.00
Race	White	867	1,053,003	1,052,071	1,048,314	0.45	0.36
	Black	2	1,242	2,588	6,345	-80.42	-59.22
	Other	25	28,990	28,576	28,576	1.45	-0.00
Hispanicity	Hispanic	85	67,960	70,015	70,015	-2.93	-0.00
	Non-Hispanic	809	1,015,275	1,013,220	1,013,220	0.20	0.00
Gender	Male	447	536,684	534,917	534,917	0.33	0.00
	Female	447	546,551	548,318	548,318	-0.32	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.15 2000 NHSDA Slippage Rates: Illinois

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		3,660	9,768,477	9,768,477	9,768,477	0.00	0.00
Quarter	Quarter 1	869	2,432,665	2,432,665	2,432,665	0.00	0.00
	Quarter 2	945	2,438,254	2,438,254	2,438,254	0.00	0.00
	Quarter 3	1,010	2,445,226	2,445,226	2,445,226	0.00	0.00
	Quarter 4	836	2,452,331	2,452,332	2,452,332	-0.00	0.00
Age Group	12-17	1,262	1,002,444	997,904	997,904	0.45	0.00
	18-25	1,128	1,279,458	1,305,857	1,305,857	-2.02	0.00
	26-34	595	1,520,774	1,481,140	1,481,140	2.68	0.00
	35-49	403	2,817,659	2,826,618	2,826,618	-0.32	0.00
	50+	272	3,148,142	3,156,957	3,156,957	-0.28	0.00
Race	White	2,849	7,856,739	8,002,978	8,002,978	-1.83	0.00
	Black	607	1,464,582	1,404,350	1,404,350	4.29	0.00
	Other	204	447,155	361,148	361,148	23.81	0.00
Hispanicity	Hispanic	574	944,958	966,261	966,261	-2.20	0.00
	Non-Hispanic	3,086	8,823,519	8,802,216	8,802,216	0.24	0.00
Gender	Male	1,742	4,709,506	4,698,202	4,698,202	0.24	0.00
	Female	1,918	5,058,971	5,070,275	5,070,275	-0.22	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.16 2000 NHSDA Slippage Rates: Indiana

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C% %
Total		1,061	4,949,369	4,949,369	4,949,369	0.00	0.00
Quarter	Quarter 1	247	1,234,336	1,234,336	1,234,336	0.00	0.00
	Quarter 2	337	1,236,005	1,236,005	1,236,005	0.00	0.00
	Quarter 3	290	1,238,326	1,238,326	1,238,326	0.00	0.00
	Quarter 4	187	1,240,702	1,240,702	1,240,702	0.00	0.00
Age Group	12-17	405	507,766	512,227	512,227	-0.87	0.00
	18-25	353	666,699	664,863	664,863	0.28	0.00
	26-34	136	750,797	740,377	740,377	1.41	0.00
	35-49	98	1,385,674	1,400,228	1,400,228	-1.04	0.00
	50+	69	1,638,433	1,631,674	1,631,674	0.41	0.00
Race	White	980	4,494,334	4,502,376	4,502,376	-0.18	0.00
	Black	51	367,899	385,805	385,805	-4.64	0.00
	Other	30	87,135	61,187	61,187	42.41	0.00
Hispanicity	Hispanic	40	114,562	112,711	112,711	1.64	0.00
	Non-Hispanic	1,021	4,834,807	4,836,658	4,836,658	-0.04	0.00
Gender	Male	533	2,412,019	2,382,407	2,382,407	1.24	0.00
	Female	528	2,537,350	2,566,962	2,566,962	-1.15	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.17 2000 NHSDA Slippage Rates: Iowa

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		921	2,390,150	2,390,150	2,390,150	0.00	0.00
Quarter	Quarter 1	247	596,092	596,092	596,092	0.00	-0.00
	Quarter 2	250	596,890	596,890	596,890	0.00	0.00
	Quarter 3	224	598,013	598,013	598,013	0.00	0.00
	Quarter 4	200	599,156	599,156	599,156	0.00	0.00
Age Group	12-17	284	248,481	249,224	249,224	-0.30	-0.00
	18-25	324	322,885	319,235	319,235	1.14	0.00
	26-34	124	332,463	327,348	327,348	1.56	0.00
	35-49	91	627,777	642,152	642,152	-2.24	0.00
	50+	98	858,545	852,191	852,191	0.75	0.00
Race	White	873	2,318,353	2,304,437	2,304,437	0.60	0.00
	Black	16	38,255	45,552	45,552	-16.02	0.00
	Other	32	33,542	40,162	40,162	-16.48	0.00
Hispanicity	Hispanic	22	44,080	41,657	41,657	5.82	0.00
	Non-Hispanic	899	2,346,070	2,348,493	2,348,493	-0.10	0.00
Gender	Male	449	1,163,992	1,155,078	1,155,078	0.77	0.00
	Female	472	1,226,159	1,235,072	1,235,072	-0.72	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.18 2000 NHSDA Slippage Rates: Kansas

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		897	2,154,766	2,154,766	2,154,766	-0.00	-0.00
Quarter	Quarter 1	283	537,142	537,142	537,142	-0.00	-0.00
	Quarter 2	273	538,031	538,031	538,031	0.00	0.00
	Quarter 3	214	539,193	539,193	539,193	0.00	0.00
	Quarter 4	127	540,399	540,399	540,399	0.00	0.00
Age Group	12-17	291	239,349	240,454	240,454	-0.46	0.00
	18-25	323	291,500	292,548	292,548	-0.36	0.00
	26-34	106	301,963	305,317	305,317	-1.10	0.00
	35-49	99	604,672	603,878	603,878	0.13	-0.00
	50+	78	717,282	712,568	712,568	0.66	0.00
Race	White	799	1,982,952	1,969,332	1,969,332	0.69	-0.00
	Black	55	125,762	125,305	125,305	0.36	0.00
	Other	43	46,052	60,128	60,128	-23.41	0.00
Hispanicity	Hispanic	100	94,021	105,554	105,554	-10.93	-0.00
	Non-Hispanic	797	2,060,745	2,049,212	2,049,212	0.56	0.00
Gender	Male	431	1,046,076	1,048,611	1,048,611	-0.24	-0.00
	Female	466	1,108,689	1,106,155	1,106,155	0.23	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.19 2000 NHSDA Slippage Rates: Kentucky

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		1,018	3,287,466	3,287,466	3,287,466	0.00	0.00
Quarter	Quarter 1	232	820,004	820,004	820,004	0.00	0.00
	Quarter 2	264	821,023	821,023	821,023	0.00	-0.00
	Quarter 3	299	822,468	822,468	822,468	0.00	0.00
	Quarter 4	223	823,971	823,971	823,971	0.00	-0.00
Age Group	12-17	341	332,760	328,973	328,973	1.15	0.00
	18-25	345	430,976	434,735	434,735	-0.86	0.00
	26-34	147	476,746	476,774	476,774	-0.01	-0.00
	35-49	96	920,697	922,922	922,922	-0.24	0.00
	50+	89	1,126,288	1,124,063	1,124,063	0.20	0.00
Race	White	931	3,030,172	3,042,885	3,042,885	-0.42	0.00
	Black	75	218,046	216,718	216,718	0.61	0.00
	Other	12	39,248	27,863	27,863	40.86	0.00
Hispanicity	Hispanic	13	7,473	21,667	21,667	-65.51	0.00
	Non-Hispanic	1,005	3,279,993	3,265,800	3,265,800	0.43	0.00
Gender	Male	466	1,571,163	1,573,317	1,573,317	-0.14	0.00
	Female	552	1,716,303	1,714,150	1,714,150	0.13	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.20 2000 NHSDA Slippage Rates: Louisiana

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		939	3,561,324	3,561,324	3,561,324	0.00	0.00
Quarter	Quarter 1	250	887,027	887,027	887,027	0.00	0.00
	Quarter 2	227	888,939	888,939	888,939	0.00	0.00
	Quarter 3	233	891,406	891,406	891,406	0.00	-0.00
	Quarter 4	229	893,952	893,952	893,952	0.00	0.00
Age Group	12-17	356	417,883	417,883	417,883	0.00	0.00
	18-25	278	518,580	519,268	519,268	-0.13	0.00
	26-34	124	498,451	511,679	511,679	-2.59	-0.00
	35-49	93	968,985	966,644	966,644	0.24	0.00
	50+	88	1,157,425	1,145,850	1,145,850	1.01	0.00
Race	White	585	2,367,973	2,395,503	2,395,503	-1.15	0.00
	Black	329	1,094,855	1,102,624	1,102,624	-0.70	0.00
	Other	25	98,496	63,197	63,197	55.85	0.00
Hispanicity	Hispanic	22	109,038	100,503	100,503	8.49	0.00
	Non-Hispanic	917	3,452,286	3,460,821	3,460,821	-0.25	-0.00
Gender	Male	431	1,668,287	1,681,419	1,681,419	-0.78	0.00
	Female	508	1,893,037	1,879,904	1,879,904	0.70	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.21 2000 NHSDA Slippage Rates: Maine

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		901	1,046,723	1,046,723	1,046,723	0.00	0.00
Quarter	Quarter 1	184	261,152	261,152	261,152	0.00	0.00
	Quarter 2	221	261,436	261,436	261,436	0.00	0.00
	Quarter 3	262	261,849	261,849	261,849	0.00	0.00
	Quarter 4	234	262,285	262,285	262,285	0.00	0.00
Age Group	12-17	321	103,353	102,866	102,866	0.47	0.00
	18-25	234	118,842	121,507	121,507	-2.19	0.00
	26-34	82	143,791	141,849	141,849	1.37	0.00
	35-49	98	308,276	313,483	313,483	-1.66	0.00
	50+	166	372,461	367,018	367,018	1.48	-0.00
Race	White	872	1,025,738	1,031,222	1,031,222	-0.53	0.00
	Black	9	7,051	3,095	3,095	127.83	0.00
	Other	20	13,934	12,407	12,407	12.31	0.00
Hispanicity	Hispanic	16	4,971	7,206	7,206	-31.01	0.00
	Non-Hispanic	885	1,041,752	1,039,518	1,039,518	0.21	0.00
Gender	Male	421	512,013	504,257	504,257	1.54	0.00
	Female	480	534,711	542,467	542,467	-1.43	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.22 2000 NHSDA Slippage Rates: Maryland

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		967	4,281,212	4,281,212	4,281,212	-0.00	0.00
Quarter	Quarter 1	262	1,066,336	1,066,336	1,066,336	-0.00	0.00
	Quarter 2	309	1,068,638	1,068,638	1,068,638	0.00	0.00
	Quarter 3	263	1,071,571	1,071,571	1,071,571	0.00	0.00
	Quarter 4	133	1,074,667	1,074,667	1,074,667	0.00	-0.00
Age Group	12-17	332	418,624	421,420	421,420	-0.66	0.00
	18-25	317	505,254	510,388	510,388	-1.01	0.00
	26-34	155	648,179	650,773	650,773	-0.40	0.00
	35-49	105	1,356,976	1,346,451	1,346,451	0.78	0.00
	50+	58	1,352,180	1,352,180	1,352,180	-0.00	-0.00
Race	White	605	2,893,352	2,928,057	2,928,057	-1.19	0.00
	Black	287	1,146,052	1,164,119	1,164,119	-1.55	0.00
	Other	75	241,807	189,036	189,036	27.92	-0.00
Hispanicity	Hispanic	74	179,475	167,369	167,369	7.23	0.00
	Non-Hispanic	893	4,101,737	4,113,843	4,113,843	-0.29	-0.00
Gender	Male	453	2,041,983	2,032,308	2,032,308	0.48	0.00
	Female	514	2,239,228	2,248,904	2,248,904	-0.43	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.23 2000 NHSDA Slippage Rates: Massachusetts

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		1,002	5,119,341	5,119,341	5,119,341	-0.00	0.00
Quarter	Quarter 1	229	1,276,115	1,276,115	1,276,115	-0.00	0.00
	Quarter 2	272	1,278,234	1,278,234	1,278,234	-0.00	0.00
	Quarter 3	281	1,281,051	1,281,051	1,281,051	0.00	0.00
	Quarter 4	220	1,283,942	1,283,942	1,283,942	0.00	0.00
Age Group	12-17	378	509,105	504,348	504,348	0.94	0.00
	18-25	298	606,908	610,746	610,746	-0.63	0.00
	26-34	139	801,554	809,055	809,055	-0.93	0.00
	35-49	96	1,497,899	1,494,797	1,494,797	0.21	0.00
	50+	91	1,703,874	1,700,396	1,700,396	0.20	-0.00
Race	White	851	4,488,372	4,615,783	4,615,783	-2.76	-0.00
	Black	92	444,859	301,554	301,554	47.52	0.00
	Other	59	186,111	202,004	202,004	-7.87	-0.00
Hispanicity	Hispanic	102	310,195	291,058	321,471	-3.51	-9.46
	Non-Hispanic	900	4,809,146	4,828,283	4,797,870	0.24	0.63
Gender	Male	480	2,439,795	2,447,382	2,447,382	-0.31	0.00
	Female	522	2,679,546	2,671,959	2,671,959	0.28	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.24 2000 NHSDA Slippage Rates: Michigan

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C% %
Total		3,576	7,917,780	7,917,780	7,917,780	0.00	0.00
Quarter	Quarter 1	952	1,973,880	1,973,880	1,973,880	0.00	0.00
	Quarter 2	833	1,977,019	1,977,019	1,977,019	0.00	0.00
	Quarter 3	910	1,981,271	1,981,271	1,981,271	0.00	0.00
	Quarter 4	881	1,985,610	1,985,610	1,985,610	0.00	0.00
Age Group	12-17	1,234	830,525	832,497	832,497	-0.24	0.00
	18-25	1,090	1,026,313	1,032,005	1,032,005	-0.55	0.00
	26-34	511	1,192,905	1,177,291	1,177,291	1.33	0.00
	35-49	406	2,270,377	2,284,991	2,284,991	-0.64	0.00
	50+	335	2,597,661	2,590,995	2,590,995	0.26	0.00
Race	White	2,954	6,623,169	6,639,443	6,639,443	-0.25	0.00
	Black	510	1,114,474	1,098,949	1,098,949	1.41	0.00
	Other	112	180,137	179,388	179,388	0.42	0.00
Hispanicity	Hispanic	113	191,784	200,476	200,476	-4.34	0.00
	Non-Hispanic	3,463	7,725,996	7,717,304	7,717,304	0.11	0.00
Gender	Male	1,676	3,818,537	3,809,680	3,809,680	0.23	0.00
	Female	1,900	4,099,244	4,108,100	4,108,100	-0.22	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.25 2000 NHSDA Slippage Rates: Minnesota

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		893	3,954,367	3,954,367	3,954,367	0.00	0.00
Quarter	Quarter 1	252	986,329	986,329	986,329	0.00	-0.00
	Quarter 2	234	987,587	987,587	987,587	0.00	0.00
	Quarter 3	233	989,345	989,345	989,345	-0.00	0.00
	Quarter 4	174	991,106	991,106	991,106	0.00	0.00
Age Group	12-17	297	426,623	430,849	430,849	-0.98	-0.00
	18-25	306	545,449	538,970	538,970	1.20	0.00
	26-34	117	598,837	568,819	568,819	5.28	0.00
	35-49	88	1,136,420	1,168,691	1,168,691	-2.76	0.00
	50+	85	1,247,038	1,247,038	1,247,038	0.00	-0.00
Race	White	826	3,675,639	3,693,746	3,693,746	-0.49	0.00
	Black	26	137,957	115,584	115,584	19.36	0.00
	Other	41	140,771	145,037	145,037	-2.94	-0.00
Hispanicity	Hispanic	41	72,499	70,982	70,982	2.14	0.00
	Non-Hispanic	852	3,881,867	3,883,385	3,883,385	-0.04	0.00
Gender	Male	444	1,935,463	1,936,035	1,936,035	-0.03	0.00
	Female	449	2,018,904	2,018,332	2,018,332	0.03	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.26 2000 NHSDA Slippage Rates: Mississippi

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C% %
Total		917	2,270,232	2,270,232	2,270,232	0.00	0.00
Quarter	Quarter 1	229	565,572	565,572	565,572	-0.00	0.00
	Quarter 2	201	566,705	566,705	566,705	-0.00	0.00
	Quarter 3	273	568,200	568,200	568,200	0.00	0.00
	Quarter 4	214	569,755	569,755	569,755	-0.00	0.00
Age Group	12-17	309	257,584	259,332	259,332	-0.67	0.00
	18-25	320	324,635	323,076	323,076	0.48	0.00
	26-34	144	340,293	341,179	341,179	-0.26	-0.00
	35-49	79	598,300	602,609	602,609	-0.72	0.00
	50+	65	749,421	744,037	744,037	0.72	0.00
Race	White	456	1,471,069	1,469,795	1,469,795	0.09	0.00
	Black	441	777,188	777,444	777,444	-0.03	0.00
	Other	20	21,975	22,993	22,993	-4.43	-0.00
Hispanicity	Hispanic	2	1,679	1,533	18,229	-90.79	-91.59
	Non-Hispanic	915	2,268,553	2,268,699	2,252,003	0.73	0.74
Gender	Male	421	1,067,876	1,068,316	1,068,316	-0.04	0.00
	Female	496	1,202,356	1,201,916	1,201,916	0.04	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.27 2000 NHSDA Slippage Rates: Missouri

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		893	4,534,101	4,534,101	4,534,101	0.00	0.00
Quarter	Quarter 1	239	1,130,521	1,130,521	1,130,521	0.00	0.00
	Quarter 2	217	1,132,199	1,132,199	1,132,199	0.00	0.00
	Quarter 3	239	1,134,504	1,134,504	1,134,504	0.00	0.00
	Quarter 4	198	1,136,877	1,136,877	1,136,877	0.00	0.00
Age Group	12-17	314	488,754	476,007	476,007	2.68	0.00
	18-25	302	586,481	595,599	595,599	-1.53	0.00
	26-34	107	648,474	635,847	635,847	1.99	0.00
	35-49	86	1,275,237	1,274,376	1,274,376	0.07	-0.00
	50+	84	1,535,156	1,552,270	1,552,270	-1.10	0.00
Race	White	752	4,041,833	3,993,675	3,993,675	1.21	0.00
	Black	125	465,759	470,719	470,719	-1.05	0.00
	Other	16	26,509	69,706	69,706	-61.97	0.00
Hispanicity	Hispanic	17	49,023	72,389	72,389	-32.28	0.00
	Non-Hispanic	876	4,485,078	4,461,712	4,461,712	0.52	0.00
Gender	Male	427	2,172,450	2,168,062	2,168,062	0.20	0.00
	Female	466	2,361,651	2,366,038	2,366,038	-0.19	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.28 2000 NHSDA Slippage Rates: Montana

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C% %
Total		914	775,525	775,525	775,525	0.00	0.00
Quarter	Quarter 1	244	193,357	193,357	193,357	-0.00	0.00
	Quarter 2	166	193,656	193,656	193,656	0.00	-0.00
	Quarter 3	191	194,050	194,050	194,050	0.00	-0.00
	Quarter 4	313	194,462	194,462	194,462	0.00	0.00
Age Group	12-17	276	84,383	84,590	84,590	-0.24	0.00
	18-25	334	101,884	99,792	99,792	2.10	0.00
	26-34	70	96,323	98,208	98,208	-1.92	0.00
	35-49	89	211,664	215,198	215,198	-1.64	0.00
	50+	145	281,271	277,737	277,737	1.27	0.00
Race	White	840	725,628	723,752	723,752	0.26	0.00
	Black	4	2,916	3,174	3,174	-8.14	-0.00
	Other	70	46,981	48,599	48,599	-3.33	0.00
Hispanicity	Hispanic	27	19,286	15,410	15,410	25.15	0.00
	Non-Hispanic	887	756,239	760,115	760,115	-0.51	-0.00
Gender	Male	442	379,474	380,449	380,449	-0.26	-0.00
	Female	472	396,051	395,076	395,076	0.25	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.29 2000 NHSDA Slippage Rates: Nebraska

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		906	1,375,781	1,375,781	1,375,781	-0.00	0.00
Quarter	Quarter 1	221	343,046	343,046	343,046	-0.00	0.00
	Quarter 2	268	343,555	343,555	343,555	0.00	0.00
	Quarter 3	251	344,236	344,236	344,236	0.00	0.00
	Quarter 4	166	344,944	344,944	344,944	-0.00	-0.00
Age Group	12-17	311	153,609	153,955	153,955	-0.22	-0.00
	18-25	291	187,651	189,383	189,383	-0.91	0.00
	26-34	70	187,223	188,960	188,960	-0.92	0.00
	35-49	94	388,993	378,521	378,521	2.77	0.00
	50+	140	458,306	464,963	464,963	-1.43	-0.00
Race	White	824	1,297,737	1,297,020	1,297,020	0.06	-0.00
	Black	57	48,679	51,159	51,159	-4.85	0.00
	Other	25	29,365	27,602	27,602	6.39	-0.00
Hispanicity	Hispanic	46	43,545	44,912	44,912	-3.04	0.00
	Non-Hispanic	860	1,332,236	1,330,869	1,330,869	0.10	0.00
Gender	Male	435	662,722	664,351	664,351	-0.25	0.00
	Female	471	713,059	711,430	711,430	0.23	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.30 2000 NHSDA Slippage Rates: Nevada

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		925	1,544,182	1,544,182	1,544,182	0.00	0.00
Quarter	Quarter 1	283	384,347	384,347	384,347	0.00	0.00
	Quarter 2	280	385,369	385,369	385,369	0.00	0.00
	Quarter 3	223	386,599	386,599	386,599	0.00	0.00
	Quarter 4	139	387,867	387,867	387,867	0.00	0.00
Age Group	12-17	305	145,690	146,483	146,483	-0.54	0.00
	18-25	284	186,819	183,571	183,571	1.77	0.00
	26-34	96	222,034	216,394	216,394	2.61	0.00
	35-49	108	462,425	466,210	466,210	-0.81	0.00
	50+	132	527,213	531,524	531,524	-0.81	0.00
Race	White	720	1,320,462	1,347,056	1,347,056	-1.97	0.00
	Black	97	102,714	103,964	103,964	-1.20	-0.00
	Other	108	121,006	93,162	93,162	29.89	0.00
Hispanicity	Hispanic	244	218,995	217,243	217,243	0.81	0.00
	Non-Hispanic	681	1,325,187	1,326,939	1,326,939	-0.13	-0.00
Gender	Male	433	756,994	768,508	768,508	-1.50	0.00
	Female	492	787,187	775,673	775,673	1.48	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.31 2000 NHSDA Slippage Rates: New Hampshire

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		883	1,007,393	1,007,393	1,007,393	-0.00	-0.00
Quarter	Quarter 1	198	251,408	251,408	251,408	-0.00	0.00
	Quarter 2	278	251,641	251,641	251,641	0.00	0.00
	Quarter 3	250	251,991	251,991	251,991	0.00	-0.00
	Quarter 4	157	252,352	252,352	252,352	-0.00	-0.00
Age Group	12-17	280	104,317	104,988	104,988	-0.64	0.00
	18-25	246	125,824	120,429	120,429	4.48	-0.00
	26-34	98	146,200	150,924	150,924	-3.13	-0.00
	35-49	117	316,793	318,851	318,851	-0.65	0.00
	50+	142	314,259	312,201	312,201	0.66	0.00
Race	White	861	985,664	987,294	987,294	-0.17	0.00
	Black	6	6,027	6,317	6,317	-4.58	-0.00
	Other	16	15,702	13,783	13,783	13.92	0.00
Hispanicity	Hispanic	22	17,906	13,312	13,312	34.50	0.00
	Non-Hispanic	861	989,488	994,081	994,081	-0.46	-0.00
Gender	Male	422	487,863	490,592	490,592	-0.56	-0.00
	Female	461	519,531	516,802	516,802	0.53	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.32 2000 NHSDA Slippage Rates: New Jersey

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C% %
Total		1,200	6,716,752	6,716,752	6,716,752	-0.00	0.00
Quarter	Quarter 1	283	1,671,635	1,671,635	1,671,635	-0.00	0.00
	Quarter 2	339	1,676,143	1,676,143	1,676,143	-0.00	0.00
	Quarter 3	377	1,681,668	1,681,668	1,681,668	-0.00	0.00
	Quarter 4	201	1,687,306	1,687,306	1,687,306	0.00	0.00
Age Group	12-17	553	633,168	628,765	628,765	0.70	0.00
	18-25	289	786,118	782,793	782,793	0.42	0.00
	26-34	143	951,000	983,799	983,799	-3.33	0.00
	35-49	110	2,048,909	2,007,041	2,007,041	2.09	0.00
	50+	105	2,297,556	2,314,355	2,314,355	-0.73	0.00
Race	White	874	5,144,859	5,363,608	5,363,608	-4.08	-0.00
	Black	196	1,087,297	947,603	947,603	14.74	0.00
	Other	130	484,596	405,541	405,541	19.49	0.00
Hispanicity	Hispanic	190	818,069	820,259	820,259	-0.27	0.00
	Non-Hispanic	1,010	5,898,683	5,896,493	5,896,493	0.04	0.00
Gender	Male	609	3,189,471	3,200,445	3,200,445	-0.34	0.00
	Female	591	3,527,281	3,516,307	3,516,307	0.31	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.33 2000 NHSDA Slippage Rates: New Mexico

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		874	1,490,294	1,490,294	1,490,294	-0.00	0.00
Quarter	Quarter 1	196	369,878	369,878	369,878	0.00	0.00
	Quarter 2	252	371,583	371,583	371,583	-0.00	0.00
	Quarter 3	257	373,467	373,467	373,467	-0.00	0.00
	Quarter 4	169	375,366	375,366	375,366	0.00	0.00
Age Group	12-17	315	171,914	173,904	173,904	-1.14	0.00
	18-25	267	210,774	211,047	211,047	-0.13	0.00
	26-34	62	206,730	210,147	210,147	-1.63	0.00
	35-49	102	425,059	420,910	420,910	0.99	0.00
	50+	128	475,817	474,286	474,286	0.32	0.00
Race	White	755	1,290,650	1,312,002	1,312,002	-1.63	0.00
	Black	16	36,120	35,519	35,519	1.69	0.00
	Other	103	163,523	142,773	142,773	14.53	0.00
Hispanicity	Hispanic	370	566,328	581,209	581,209	-2.56	0.00
	Non-Hispanic	504	923,966	909,085	909,085	1.64	0.00
Gender	Male	409	711,948	721,553	721,553	-1.33	0.00
	Female	465	778,346	768,741	768,741	1.25	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.34 2000 NHSDA Slippage Rates: New York

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		3,589	14,781,590	14,781,590	14,781,590	0.00	0.00
Quarter	Quarter 1	957	3,677,643	3,677,643	3,677,643	-0.00	0.00
	Quarter 2	1,026	3,688,309	3,688,309	3,688,309	0.00	0.00
	Quarter 3	866	3,701,244	3,701,244	3,701,244	0.00	0.00
	Quarter 4	740	3,714,395	3,714,395	3,714,395	0.00	0.00
Age Group	12-17	1,160	1,479,846	1,476,248	1,476,248	0.24	0.00
	18-25	1,142	1,825,136	1,824,978	1,824,978	0.01	0.00
	26-34	564	2,212,373	2,231,961	2,231,961	-0.88	0.00
	35-49	390	4,265,430	4,233,569	4,233,569	0.75	0.00
	50+	333	4,998,805	5,014,834	5,014,834	-0.32	0.00
Race	White	2,516	10,866,589	11,361,666	11,363,118	-4.37	-0.01
	Black	755	2,741,351	2,521,622	2,521,622	8.71	0.00
	Other	318	1,173,649	898,301	896,849	30.86	0.16
Hispanicity	Hispanic	614	2,149,725	2,153,106	2,153,106	-0.16	0.00
	Non-Hispanic	2,975	12,631,865	12,628,484	12,628,484	0.03	0.00
Gender	Male	1,667	6,993,653	6,987,384	6,987,384	0.09	0.00
	Female	1,922	7,787,937	7,794,206	7,794,206	-0.08	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.35 2000 NHSDA Slippage Rates: North Carolina

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		1,043	6,365,030	6,365,030	6,365,030	0.00	0.00
Quarter	Quarter 1	266	1,586,440	1,586,440	1,586,440	0.00	0.00
	Quarter 2	238	1,589,159	1,589,159	1,589,159	-0.00	0.00
	Quarter 3	305	1,592,780	1,592,780	1,592,780	0.00	0.00
	Quarter 4	234	1,596,651	1,596,651	1,596,651	0.00	0.00
Age Group	12-17	418	655,904	651,483	651,483	0.68	0.00
	18-25	326	765,139	777,179	777,179	-1.55	0.00
	26-34	141	979,631	962,789	962,789	1.75	0.00
	35-49	91	1,797,925	1,809,078	1,809,078	-0.62	0.00
	50+	67	2,166,431	2,164,502	2,164,502	0.09	-0.00
Race	White	727	4,850,132	4,868,731	4,868,731	-0.38	0.00
	Black	275	1,356,673	1,347,291	1,347,291	0.70	0.00
	Other	41	158,224	149,007	149,007	6.19	0.00
Hispanicity	Hispanic	69	128,390	85,340	85,340	50.44	-0.00
	Non-Hispanic	974	6,236,640	6,279,689	6,279,689	-0.69	0.00
Gender	Male	494	3,015,224	3,032,822	3,032,822	-0.58	0.00
	Female	549	3,349,806	3,332,208	3,332,208	0.53	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.36 2000 NHSDA Slippage Rates: North Dakota

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		896	535,301	535,301	535,301	0.00	-0.00
Quarter	Quarter 1	232	133,503	133,503	133,503	-0.00	0.00
	Quarter 2	200	133,684	133,684	133,684	0.00	-0.00
	Quarter 3	255	133,928	133,928	133,928	0.00	0.00
	Quarter 4	209	134,185	134,185	134,185	0.00	-0.00
Age Group	12-17	288	61,675	62,124	62,124	-0.72	-0.00
	18-25	320	76,884	77,344	77,344	-0.59	0.00
	26-34	73	73,294	73,090	73,090	0.28	0.00
	35-49	86	138,886	139,429	139,429	-0.39	0.00
	50+	129	184,561	183,316	183,316	0.68	-0.00
Race	White	842	510,863	507,407	507,407	0.68	-0.00
	Black	8	1,374	2,121	2,121	-35.25	0.00
	Other	46	23,065	25,772	25,772	-10.51	0.00
Hispanicity	Hispanic	13	6,420	5,162	5,162	24.36	-0.00
	Non-Hispanic	883	528,881	530,139	530,139	-0.24	0.00
Gender	Male	439	262,160	262,929	262,929	-0.29	0.00
	Female	457	273,141	272,372	272,372	0.28	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.37 2000 NHSDA Slippage Rates: Ohio

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		3,678	9,291,886	9,291,886	9,291,886	-0.00	0.00
Quarter	Quarter 1	913	2,316,910	2,316,910	2,316,910	0.00	0.00
	Quarter 2	1,077	2,320,283	2,320,283	2,320,283	0.00	0.00
	Quarter 3	1,015	2,324,952	2,324,952	2,324,952	-0.00	0.00
	Quarter 4	673	2,329,742	2,329,742	2,329,742	0.00	0.00
Age Group	12-17	1,227	952,166	951,150	951,150	0.11	0.00
	18-25	1,215	1,209,754	1,211,748	1,211,748	-0.16	0.00
	26-34	525	1,353,495	1,344,556	1,344,556	0.66	0.00
	35-49	369	2,625,665	2,622,906	2,622,906	0.11	0.00
	50+	342	3,150,807	3,161,526	3,161,526	-0.34	0.00
Race	White	3,147	8,117,896	8,151,034	8,151,034	-0.41	0.00
	Black	465	1,023,782	1,008,201	1,008,201	1.55	0.00
	Other	66	150,208	132,651	132,651	13.24	0.00
Hispanicity	Hispanic	78	141,176	147,962	147,962	-4.59	0.00
	Non-Hispanic	3,600	9,150,711	9,143,925	9,143,925	0.07	-0.00
Gender	Male	1,770	4,444,788	4,441,891	4,441,891	0.07	0.00
	Female	1,908	4,847,098	4,849,995	4,849,995	-0.06	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.38 2000 NHSDA Slippage Rates: Oklahoma

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		973	2,743,895	2,743,895	2,743,895	0.00	0.00
Quarter	Quarter 1	281	683,677	683,677	683,677	0.00	0.00
	Quarter 2	276	685,015	685,015	685,015	0.00	0.00
	Quarter 3	261	686,715	686,715	686,715	-0.00	0.00
	Quarter 4	155	688,488	688,488	688,488	0.00	-0.00
Age Group	12-17	303	310,623	305,523	305,523	1.67	0.00
	18-25	374	361,155	366,598	366,598	-1.48	-0.00
	26-34	139	367,141	366,798	366,798	0.09	0.00
	35-49	77	717,195	728,210	728,210	-1.51	-0.00
	50+	80	987,780	976,765	976,765	1.13	0.00
Race	White	782	2,348,858	2,275,448	2,275,448	3.23	0.00
	Black	88	207,742	207,711	207,711	0.02	0.00
	Other	103	187,294	260,736	260,736	-28.17	-0.00
Hispanicity	Hispanic	72	78,950	93,695	93,695	-15.74	-0.00
	Non-Hispanic	901	2,664,944	2,650,199	2,650,199	0.56	0.00
Gender	Male	474	1,313,412	1,317,128	1,317,128	-0.28	0.00
	Female	499	1,430,483	1,426,766	1,426,766	0.26	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.39 2000 NHSDA Slippage Rates: Oregon

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		864	2,827,438	2,827,438	2,827,438	0.00	-0.00
Quarter	Quarter 1	240	704,667	704,667	704,667	-0.00	0.00
	Quarter 2	234	705,927	705,927	705,927	0.00	-0.00
	Quarter 3	238	707,584	707,584	707,584	0.00	-0.00
	Quarter 4	152	709,260	709,260	709,260	0.00	0.00
Age Group	12-17	288	278,251	276,345	276,345	0.69	-0.00
	18-25	275	350,437	354,586	354,586	-1.17	-0.00
	26-34	157	374,862	378,523	378,523	-0.97	0.00
	35-49	74	789,597	803,183	803,183	-1.69	-0.00
	50+	70	1,034,290	1,014,801	1,014,801	1.92	-0.00
Race	White	798	2,677,926	2,644,956	2,644,956	1.25	-0.00
	Black	18	26,987	18,143	49,739	-45.74	-63.52
	Other	48	122,525	164,339	132,742	-7.70	23.80
Hispanicity	Hispanic	63	96,850	147,975	147,975	-34.55	-0.00
	Non-Hispanic	801	2,730,588	2,679,463	2,679,463	1.91	0.00
Gender	Male	428	1,399,110	1,384,254	1,384,254	1.07	0.00
	Female	436	1,428,328	1,443,184	1,443,184	-1.03	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.40 2000 NHSDA Slippage Rates: Pennsylvania

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		3,997	10,117,018	10,117,018	10,117,018	0.00	0.00
Quarter	Quarter 1	742	2,522,111	2,522,111	2,522,111	0.00	0.00
	Quarter 2	769	2,526,098	2,526,098	2,526,098	0.00	-0.00
	Quarter 3	1,256	2,531,575	2,531,575	2,531,575	0.00	0.00
	Quarter 4	1,230	2,537,234	2,537,234	2,537,234	0.00	0.00
Age Group	12-17	1,474	995,027	987,669	987,669	0.74	0.00
	18-25	1,195	1,173,278	1,186,229	1,186,229	-1.09	0.00
	26-34	592	1,404,204	1,413,669	1,413,669	-0.67	0.00
	35-49	374	2,847,359	2,823,281	2,823,281	0.85	0.00
	50+	362	3,697,151	3,706,171	3,706,171	-0.24	-0.00
Race	White	3,398	8,974,645	8,995,843	8,995,843	-0.24	-0.00
	Black	485	947,423	933,292	933,292	1.51	-0.00
	Other	114	194,950	187,884	187,884	3.76	0.00
Hispanicity	Hispanic	177	228,938	247,889	247,889	-7.64	0.00
	Non-Hispanic	3,820	9,888,080	9,869,129	9,869,129	0.19	0.00
Gender	Male	1,936	4,784,472	4,809,399	4,809,399	-0.52	0.00
	Female	2,061	5,332,547	5,307,619	5,307,619	0.47	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.41 2000 NHSDA Slippage Rates: Rhode Island

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		950	820,576	820,576	820,576	0.00	0.00
Quarter	Quarter 1	244	204,559	204,559	204,559	0.00	0.00
	Quarter 2	296	204,890	204,890	204,890	0.00	0.00
	Quarter 3	228	205,334	205,334	205,334	0.00	0.00
	Quarter 4	182	205,792	205,792	205,792	0.00	0.00
Age Group	12-17	293	83,515	83,709	83,709	-0.23	0.00
	18-25	324	94,040	94,589	94,589	-0.58	0.00
	26-34	95	127,460	127,389	127,389	0.05	0.00
	35-49	104	233,522	232,849	232,849	0.29	0.00
	50+	134	282,038	282,038	282,038	0.00	0.00
Race	White	846	738,540	757,926	757,926	-2.56	-0.00
	Black	61	44,524	38,506	38,506	15.63	0.00
	Other	43	37,512	24,144	24,144	55.37	0.00
Hispanicity	Hispanic	122	90,457	85,505	55,092	64.19	55.20
	Non-Hispanic	828	730,119	735,071	765,484	-4.62	-3.97
Gender	Male	430	398,152	391,494	391,494	1.70	0.00
	Female	520	422,424	429,082	429,082	-1.55	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.42 2000 NHSDA Slippage Rates: South Carolina

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		855	3,130,037	3,130,037	3,130,037	0.00	0.00
Quarter	Quarter 1	216	779,914	779,914	779,914	0.00	0.00
	Quarter 2	261	781,389	781,389	781,389	-0.00	-0.00
	Quarter 3	198	783,323	783,323	783,323	0.00	0.00
	Quarter 4	180	785,411	785,411	785,411	0.00	0.00
Age Group	12-17	275	324,415	326,078	326,078	-0.51	0.00
	18-25	269	378,909	385,875	385,875	-1.81	0.00
	26-34	119	465,347	460,794	460,794	0.99	0.00
	35-49	97	889,580	887,004	887,004	0.29	0.00
	50+	95	1,071,787	1,070,286	1,070,286	0.14	0.00
Race	White	523	2,192,068	2,203,911	2,203,911	-0.54	0.00
	Black	315	908,573	893,497	893,497	1.69	0.00
	Other	17	29,396	32,629	32,629	-9.91	-0.00
Hispanicity	Hispanic	13	22,999	31,928	31,928	-27.97	0.00
	Non-Hispanic	842	3,107,038	3,098,109	3,098,109	0.29	0.00
Gender	Male	399	1,463,989	1,472,547	1,472,547	-0.58	0.00
	Female	456	1,666,048	1,657,490	1,657,490	0.52	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.43 2000 NHSDA Slippage Rates: South Dakota

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		855	619,100	619,100	619,100	0.00	0.00
Quarter	Quarter 1	226	154,390	154,390	154,390	0.00	0.00
	Quarter 2	216	154,609	154,609	154,609	0.00	-0.00
	Quarter 3	204	154,899	154,899	154,899	0.00	0.00
	Quarter 4	209	155,202	155,202	155,202	0.00	0.00
Age Group	12-17	289	73,143	73,388	73,388	-0.33	0.00
	18-25	272	87,092	87,639	87,639	-0.62	0.00
	26-34	75	84,743	82,174	82,174	3.13	0.00
	35-49	87	167,638	167,821	167,821	-0.11	0.00
	50+	132	206,485	208,077	208,077	-0.77	-0.00
Race	White	763	574,811	573,117	573,117	0.30	0.00
	Black	9	2,319	2,879	2,879	-19.44	0.00
	Other	83	41,970	43,103	43,103	-2.63	-0.00
Hispanicity	Hispanic	10	4,105	6,621	6,621	-37.99	0.00
	Non-Hispanic	845	614,995	612,479	612,479	0.41	-0.00
Gender	Male	409	301,787	300,675	300,675	0.37	0.00
	Female	446	317,313	318,425	318,425	-0.35	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.44 2000 NHSDA Slippage Rates: Tennessee

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		947	4,657,042	4,657,042	4,657,042	0.00	-0.00
Quarter	Quarter 1	285	1,161,146	1,161,146	1,161,146	0.00	0.00
	Quarter 2	288	1,162,880	1,162,880	1,162,880	0.00	-0.00
	Quarter 3	218	1,165,264	1,165,264	1,165,264	-0.00	-0.00
	Quarter 4	156	1,167,751	1,167,751	1,167,751	0.00	-0.00
Age Group	12-17	367	462,583	463,518	463,518	-0.20	0.00
	18-25	285	599,034	598,099	598,099	0.16	-0.00
	26-34	140	716,773	686,854	686,854	4.36	0.00
	35-49	81	1,290,833	1,332,769	1,332,769	-3.15	0.00
	50+	74	1,587,819	1,575,802	1,575,802	0.76	0.00
Race	White	790	3,885,644	3,885,855	3,885,855	-0.01	-0.00
	Black	139	713,882	716,019	716,019	-0.30	0.00
	Other	18	57,516	55,168	55,168	4.26	0.00
Hispanicity	Hispanic	11	25,948	43,653	43,653	-40.56	-0.00
	Non-Hispanic	936	4,631,094	4,613,389	4,613,389	0.38	0.00
Gender	Male	458	2,201,355	2,218,663	2,218,663	-0.78	-0.00
	Female	489	2,455,687	2,438,379	2,438,379	0.71	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.45 2000 NHSDA Slippage Rates: Texas

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		4,020	16,057,454	16,057,454	16,057,454	0.00	0.00
Quarter	Quarter 1	1,198	3,990,981	3,990,981	3,990,981	0.00	0.00
	Quarter 2	1,239	4,005,486	4,005,486	4,005,486	0.00	0.00
	Quarter 3	944	4,022,073	4,022,073	4,022,073	0.00	0.00
	Quarter 4	639	4,038,914	4,038,914	4,038,914	0.00	0.00
Age Group	12-17	1,498	1,879,577	1,876,809	1,876,809	0.15	0.00
	18-25	1,307	2,377,766	2,367,886	2,367,886	0.42	0.00
	26-34	662	2,430,057	2,441,791	2,441,791	-0.48	0.00
	35-49	360	4,558,328	4,573,009	4,573,009	-0.32	0.00
	50+	193	4,811,725	4,797,959	4,797,959	0.29	0.00
Race	White	3,287	13,304,025	13,616,785	13,616,785	-2.30	0.00
	Black	490	1,976,834	1,921,062	1,921,062	2.90	0.00
	Other	243	776,596	519,607	519,607	49.46	0.00
Hispanicity	Hispanic	1,551	4,541,659	4,473,374	4,473,374	1.53	0.00
	Non-Hispanic	2,469	11,515,795	11,584,080	11,584,080	-0.59	0.00
Gender	Male	1,881	7,738,526	7,747,575	7,747,575	-0.12	0.00
	Female	2,139	8,318,928	8,309,880	8,309,880	0.11	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.46 2000 NHSDA Slippage Rates: Utah

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		1,031	1,714,852	1,714,852	1,714,852	0.00	-0.00
Quarter	Quarter 1	285	427,581	427,581	427,581	0.00	-0.00
	Quarter 2	362	428,243	428,243	428,243	0.00	-0.00
	Quarter 3	267	536,047	429,102	429,102	24.92	0.00
	Quarter 4	117	322,982	429,927	429,927	-24.88	0.00
Age Group	12-17	362	248,085	247,654	247,654	0.17	-0.00
	18-25	372	319,109	325,647	325,647	-2.01	-0.00
	26-34	99	280,602	267,607	267,607	4.86	0.00
	35-49	100	410,366	421,521	421,521	-2.65	0.00
	50+	98	456,691	452,422	452,422	0.94	-0.00
Race	White	972	1,611,299	1,627,871	1,627,871	-1.02	-0.00
	Black	9	18,720	15,646	15,646	19.65	-0.00
	Other	50	84,833	71,335	71,335	18.92	0.00
Hispanicity	Hispanic	62	91,750	103,088	103,088	-11.00	-0.00
	Non-Hispanic	969	1,623,101	1,611,764	1,611,764	0.70	-0.00
Gender	Male	484	842,598	843,803	843,803	-0.14	-0.00
	Female	547	872,254	871,049	871,049	0.14	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.47 2000 NHSDA Slippage Rates: Vermont

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		981	511,939	511,939	511,939	0.00	0.00
<i>Quarter</i>	Quarter 1	202	127,755	127,755	127,755	0.00	0.00
	Quarter 2	226	127,876	127,876	127,876	0.00	-0.00
	Quarter 3	235	128,060	128,060	128,060	0.00	0.00
	Quarter 4	318	128,248	128,248	128,248	0.00	0.00
<i>Age Group</i>	12-17	344	55,052	55,052	55,052	0.00	0.00
	18-25	320	63,357	62,736	62,736	0.99	0.00
	26-34	76	76,062	75,528	75,528	0.71	-0.00
	35-49	105	153,863	153,852	153,852	0.01	-0.00
	50+	136	163,605	164,771	164,771	-0.71	0.00
<i>Race</i>	White	950	503,931	503,197	503,197	0.15	0.00
	Black	8	2,611	2,542	2,542	2.73	0.00
	Other	23	5,397	6,200	6,200	-12.95	0.00
<i>Hispanicity</i>	Hispanic	18	5,536	4,869	4,869	13.70	0.00
	Non-Hispanic	963	506,403	507,070	507,070	-0.13	0.00
<i>Gender</i>	Male	521	249,460	250,915	250,915	-0.58	0.00
	Female	460	262,478	261,023	261,023	0.56	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.48 2000 NHSDA Slippage Rates: Virginia

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		1,047	5,648,419	5,648,419	5,648,419	0.00	-0.00
<i>Quarter</i>	Quarter 1	271	1,407,455	1,407,455	1,407,455	0.00	-0.00
	Quarter 2	289	1,410,144	1,410,144	1,410,144	0.00	0.00
	Quarter 3	294	1,413,551	1,413,551	1,413,551	0.00	-0.00
	Quarter 4	193	1,417,269	1,417,269	1,417,269	0.00	0.00
<i>Age Group</i>	12-17	437	565,199	562,575	562,575	0.47	0.00
	18-25	274	698,195	691,215	691,215	1.01	0.00
	26-34	140	889,908	874,486	874,486	1.76	0.00
	35-49	108	1,678,917	1,703,943	1,703,943	-1.47	-0.00
	50+	88	1,816,201	1,816,201	1,816,201	0.00	-0.00
<i>Race</i>	White	741	4,317,426	4,344,573	4,344,573	-0.62	-0.00
	Black	248	1,139,994	1,073,883	1,073,883	6.16	0.00
	Other	58	190,999	229,963	229,963	-16.94	0.00
<i>Hispanicity</i>	Hispanic	85	145,159	202,998	202,998	-28.49	-0.00
	Non-Hispanic	962	5,503,260	5,445,420	5,445,420	1.06	0.00
<i>Gender</i>	Male	528	2,723,745	2,697,578	2,697,578	0.97	-0.00
	Female	519	2,924,674	2,950,841	2,950,841	-0.89	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.49 2000 NHSDA Slippage Rates: Washington

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		1,006	4,783,724	4,783,724	4,783,724	0.00	0.00
Quarter	Quarter 1	239	1,192,143	1,192,143	1,192,143	0.00	0.00
	Quarter 2	295	1,194,351	1,194,351	1,194,351	0.00	-0.00
	Quarter 3	267	1,197,167	1,197,167	1,197,167	0.00	0.00
	Quarter 4	205	1,200,063	1,200,063	1,200,063	0.00	-0.00
Age Group	12-17	408	485,801	486,686	486,686	-0.18	-0.00
	18-25	289	610,036	605,819	605,819	0.70	0.00
	26-34	148	727,592	693,147	693,147	4.97	0.00
	35-49	97	1,410,630	1,448,407	1,448,407	-2.61	0.00
	50+	64	1,549,665	1,549,665	1,549,665	0.00	0.00
Race	White	863	4,245,229	4,277,131	4,277,131	-0.75	-0.00
	Black	50	178,782	172,132	140,536	27.21	22.48
	Other	93	359,713	334,461	366,057	-1.73	-8.63
Hispanicity	Hispanic	85	241,498	266,263	266,263	-9.30	0.00
	Non-Hispanic	921	4,542,226	4,517,461	4,517,461	0.55	-0.00
Gender	Male	488	2,350,553	2,347,603	2,347,603	0.13	-0.00
	Female	518	2,433,171	2,436,121	2,436,121	-0.12	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.50 2000 NHSDA Slippage Rates: West Virginia

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		950	1,552,525	1,552,525	1,552,525	0.00	0.00
Quarter	Quarter 1	168	387,184	387,184	387,184	0.00	0.00
	Quarter 2	228	387,701	387,701	387,701	0.00	0.00
	Quarter 3	271	388,440	388,440	388,440	0.00	0.00
	Quarter 4	283	389,200	389,200	389,200	0.00	0.00
Age Group	12-17	322	142,689	141,424	141,424	0.89	0.00
	18-25	286	190,003	194,804	194,804	-2.46	0.00
	26-34	93	209,638	208,491	208,491	0.55	0.00
	35-49	85	406,083	408,363	408,363	-0.56	0.00
	50+	164	604,111	599,442	599,442	0.78	-0.00
Race	White	902	1,496,478	1,495,952	1,495,952	0.04	0.00
	Black	35	44,683	45,161	45,161	-1.06	0.00
	Other	13	11,364	11,412	11,412	-0.42	0.00
Hispanicity	Hispanic	14	11,249	9,562	9,562	17.64	0.00
	Non-Hispanic	936	1,541,276	1,542,963	1,542,963	-0.11	0.00
Gender	Male	441	737,044	738,563	738,563	-0.21	0.00
	Female	509	815,481	813,962	813,962	0.19	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.51 2000 NHSDA Slippage Rates: Wisconsin

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C %	(F-C)/C %
Total		1,119	4,375,664	4,375,664	4,375,664	-0.00	-0.00
Quarter	Quarter 1	192	1,091,212	1,091,212	1,091,212	0.00	-0.00
	Quarter 2	191	1,092,721	1,092,721	1,092,721	0.00	0.00
	Quarter 3	336	1,094,809	1,094,809	1,094,809	-0.00	0.00
	Quarter 4	400	1,096,922	1,096,922	1,096,922	-0.00	-0.00
Age Group	12-17	453	472,708	475,692	475,692	-0.63	-0.00
	18-25	312	587,884	590,374	590,374	-0.42	-0.00
	26-34	165	631,597	626,124	626,124	0.87	0.00
	35-49	106	1,266,341	1,242,068	1,242,068	1.95	0.00
	50+	83	1,417,134	1,441,407	1,441,407	-1.68	0.00
Race	White	1,007	4,073,704	4,034,489	4,034,489	0.97	-0.00
	Black	76	225,579	234,682	234,682	-3.88	0.00
	Other	36	76,382	106,493	106,493	-28.28	-0.00
Hispanicity	Hispanic	58	65,025	105,607	105,607	-38.43	0.00
	Non-Hispanic	1,061	4,310,639	4,270,057	4,270,057	0.95	-0.00
Gender	Male	580	2,142,779	2,135,776	2,135,776	0.33	0.00
	Female	539	2,232,884	2,239,888	2,239,888	-0.31	-0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Table H.52 2000 NHSDA Slippage Rates: Wyoming

Domain		<i>n</i>	Initial Total (I) ¹	Final Total (F) ²	Census Total (C)	(I-C)/C%	(F-C)/C %
Total		828	425,325	425,324	425,324	0.00	-0.00
Quarter	Quarter 1	249	106,019	106,019	106,019	0.00	-0.00
	Quarter 2	238	106,201	106,201	106,201	0.00	0.00
	Quarter 3	223	106,433	106,433	106,433	0.00	0.00
	Quarter 4	118	106,672	106,672	106,672	-0.00	-0.00
Age Group	12-17	301	48,834	49,030	49,030	-0.40	-0.00
	18-25	255	60,947	61,441	61,441	-0.80	0.00
	26-34	65	55,507	55,943	55,943	-0.78	-0.00
	35-49	98	120,295	119,169	119,169	0.94	-0.00
	50+	109	139,741	139,741	139,741	-0.00	-0.00
Race	White	774	407,364	405,042	408,799	-0.35	-0.92
	Black	8	4,803	7,193	3,436	39.78	109.36
	Other	46	13,157	13,090	13,090	0.52	0.00
Hispanicity	Hispanic	44	27,748	26,616	26,616	4.25	0.00
	Non-Hispanic	784	397,577	398,709	398,709	-0.28	-0.00
Gender	Male	377	210,261	210,349	210,349	-0.04	-0.00
	Female	451	215,064	214,975	214,975	0.04	0.00

¹ Weight1*...*Weight12 (before person post-stratification).

² Weight1*...*Weight13 (after person post-stratification).

Appendix I

Evaluation of Calibration Weights: Weight Summary Statistics

Table I.1 2000 NHSDA DU-Level Weight Summary Statistics: United States, District of Columbia, and the 50 States

Domain	n	Before res.du.nr (Weight1*...*Weight6) ¹						After res.du.nr (Weight1*...*Weight7) ¹						After res.du.ps (Weight1*...*Weight8) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1	Med	Q3	Max	UWE ³ M
United States	169,769	16	377	522	683	3,636	1.26	34	402	561	739	2,672	1.25	11	405	597	802	5,129	1.32
Alaska	1,640	94	98	103	119	148	1.02	94	102	109	128	161	1.02	51	110	134	164	405	1.11
Alabama	2,132	508	537	662	709	1,949	1.16	531	567	688	733	2,140	1.17	159	650	738	897	2,970	1.21
Arkansas	2,215	305	317	383	525	890	1.08	314	328	399	541	933	1.09	95	397	478	577	1,990	1.10
Arizona	1,986	523	582	653	762	831	1.02	525	588	790	844	956	1.03	291	712	901	1,066	2,495	1.09
California	14,349	185	510	553	702	3,636	1.19	334	552	604	765	2,341	1.16	250	615	690	859	4,190	1.17
Colorado	2,041	476	494	626	777	1,719	1.07	476	506	681	790	1,452	1.08	195	638	788	948	2,996	1.11
Connecticut	2,509	33	411	435	504	784	1.03	219	461	492	584	853	1.03	123	429	492	554	1,620	1.08
District of Columbia	3,064	34	36	74	88	136	1.22	34	37	77	99	200	1.23	11	35	76	99	499	1.34
Delaware	1,988	96	101	112	148	172	1.04	99	109	124	160	215	1.05	31	117	143	176	498	1.10
Florida	8,038	206	570	612	708	2,583	1.13	208	609	652	746	2,672	1.12	163	623	744	878	3,366	1.14
Georgia	3,330	659	683	696	963	1,745	1.08	676	716	748	972	1,824	1.09	213	682	794	985	3,313	1.17
Hawaii	1,892	32	150	155	165	388	1.11	138	158	167	196	469	1.14	74	130	180	273	1,312	1.44
Iowa	2,055	422	441	511	521	537	1.01	428	492	533	546	695	1.01	154	514	553	615	2,448	1.05
Idaho	1,725	166	180	185	211	329	1.06	177	192	207	225	396	1.06	68	240	267	332	748	1.08
Illinois	8,406	46	416	434	468	655	1.01	161	450	493	556	796	1.02	134	460	520	588	1,851	1.05
Indiana	3,088	514	524	600	804	918	1.05	518	562	664	869	1,011	1.05	131	605	656	939	3,463	1.13
Kansas	1,815	152	361	397	480	840	1.11	296	405	431	513	1,069	1.12	113	460	519	673	1,829	1.14
Kentucky	2,306	374	483	616	778	968	1.05	485	501	670	808	987	1.05	147	554	717	840	1,730	1.08
Louisiana	1,922	677	707	778	888	1,567	1.03	678	752	805	892	1,880	1.05	217	747	849	978	3,193	1.10
Massachusetts	2,909	92	584	715	783	1,154	1.02	349	717	789	890	1,168	1.03	172	709	811	919	3,002	1.06
Maryland	2,014	115	688	812	854	1,497	1.08	539	741	854	908	1,676	1.09	250	839	904	1,019	3,344	1.12
Maine	2,292	147	152	186	221	281	1.05	158	163	199	237	313	1.05	47	178	215	267	609	1.11
Michigan	8,260	110	386	405	420	751	1.01	367	413	433	451	684	1.01	118	413	441	496	1,749	1.03
Minnesota	1,899	622	761	796	824	1,359	1.02	680	786	838	884	1,166	1.02	206	839	931	1,076	5,129	1.08
Missouri	2,518	653	668	694	818	864	1.01	658	708	765	901	1,094	1.02	206	750	857	987	2,104	1.07

¹ Weight1-Weight6 are design based weight components; NR nonresponse adjustment, PS post-stratification.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

(continued)

Table I.1 2000 NHSDA DU-Level Weight Summary Statistics: United States, District of Columbia, and the 50 States (continued)

Domain	n	Before res.du.nr (Weight1*...*Weight6) ¹						After res.du.nr (Weight1*...*Weight7) ¹						After res.du.ps (Weight1*...*Weight8) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1	Med	Q3	Max	UWE ^{3M}
Mississippi	1,883	33	425	438	528	567	1.01	220	453	486	555	623	1.01	137	484	537	673	1,670	1.07
Montana	1,836	138	144	147	190	201	1.02	145	150	157	201	221	1.02	68	175	202	239	587	1.05
North Carolina	3,008	287	720	936	966	1,441	1.03	700	789	988	1,031	1,391	1.03	219	885	1,031	1,178	3,042	1.06
North Dakota	1,921	111	132	136	141	168	1.02	113	136	143	154	243	1.02	39	121	138	156	547	1.06
Nebraska	1,846	247	255	264	285	428	1.04	257	279	290	304	536	1.04	99	304	338	400	996	1.07
New Hampshire	2,030	146	167	194	225	807	1.07	148	192	214	258	476	1.03	47	190	233	274	675	1.10
New Jersey	3,762	547	558	644	790	1,714	1.06	565	627	691	849	1,364	1.05	230	580	760	944	3,273	1.14
New Mexico	1,868	170	178	324	341	395	1.08	175	184	334	364	408	1.08	162	280	362	430	1,231	1.12
Nevada	1,800	32	292	323	353	625	1.06	80	327	357	395	684	1.05	105	315	389	466	1,296	1.17
New York	8,709	418	543	683	732	1,209	1.02	460	632	758	820	2,086	1.03	249	651	765	881	4,253	1.11
Ohio	8,506	90	393	475	488	663	1.04	385	418	499	525	769	1.04	100	458	512	585	1,699	1.06
Oklahoma	1,919	332	437	531	553	926	1.08	439	494	566	619	1,067	1.07	135	509	670	852	2,885	1.24
Oregon	1,864	187	456	485	543	854	1.06	296	494	536	612	1,024	1.07	240	591	671	775	2,528	1.12
Pennsylvania	10,082	274	284	371	542	1,385	1.09	282	298	394	565	1,017	1.09	115	349	433	609	2,266	1.11
Rhode Island	2,189	135	140	142	161	199	1.02	145	152	157	177	230	1.02	42	146	173	201	608	1.10
South Carolina	1,974	275	682	744	872	1,810	1.09	322	700	776	925	1,934	1.09	199	590	713	873	2,049	1.11
South Dakota	1,759	127	134	140	161	169	1.01	127	142	147	161	189	1.01	59	151	168	182	562	1.04
Tennessee	2,329	372	651	681	735	1,699	1.05	523	725	774	815	1,787	1.05	200	706	902	1,073	3,404	1.18
Texas	8,043	79	638	681	809	3,345	1.08	204	677	739	850	1,428	1.06	198	719	819	1,032	3,818	1.17
Utah	1,441	269	282	329	372	1,181	1.34	293	337	397	433	861	1.09	135	332	411	555	1,794	1.18
Virginia	2,885	77	683	745	803	1,713	1.04	515	755	821	980	1,782	1.04	222	753	886	1,102	2,908	1.11
Vermont	2,148	65	66	96	115	202	1.05	69	71	102	124	224	1.06	20	89	116	136	332	1.09
Washington	2,575	567	593	646	767	1,094	1.05	600	646	704	837	1,350	1.05	308	714	837	1,027	3,115	1.09
Wisconsin	3,010	433	444	477	825	1,028	1.13	443	478	504	882	1,126	1.13	121	483	560	949	3,235	1.20
West Virginia	2,443	187	202	204	293	382	1.07	206	211	216	305	418	1.07	69	231	296	376	1,015	1.10
Wyoming	1,546	16	86	89	92	393	1.09	81	91	94	104	155	1.03	33	99	118	150	429	1.16

¹ Weight1-Weight6 are design based weight components; NR nonresponse adjustment, PS post-stratification.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

Table I.2 2000 NHSDA (Selected) Person Level Weight Summary Statistics: United States, District of Columbia, and the 50 States

Domain	n	Before res.per.ps (Weight1*...*Weight10) ¹						After res.per.ps (Weight1*...*Weight11) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
United States	91,961	30	598	1,031	2,300	115,045	3.52	9	594	1,037	2,297	59,010	3.42
Alaska	1,024	51	152	232	793	3,379	1.97	40	155	243	705	2,841	1.98
Alabama	1,129	161	841	1,153	2,726	44,508	3.04	65	834	1,275	3,015	36,666	3.08
Arkansas	1,138	128	533	661	3,215	13,037	2.32	59	530	733	3,348	13,224	2.22
Arizona	1,187	432	1,022	1,481	3,102	30,099	2.67	198	1,044	1,518	2,831	30,820	2.79
California	6,609	252	847	1,497	3,369	75,776	3.53	217	841	1,518	3,420	59,010	3.36
Colorado	1,216	237	869	1,202	2,892	27,263	2.64	84	855	1,274	2,857	23,193	2.60
Connecticut	1,275	136	578	811	2,119	18,996	2.28	85	553	843	2,390	20,015	2.46
District of Columbia	1,082	34	108	160	577	2,812	2.12	18	103	182	577	3,477	2.24
Delaware	1,258	36	152	228	810	3,143	1.88	18	147	239	854	2,997	1.98
Florida	4,308	199	762	1,071	2,796	43,886	2.80	120	776	1,101	2,789	33,555	2.68
Georgia	1,453	220	869	1,746	3,990	51,590	3.38	127	853	1,689	4,042	38,150	3.19
Hawaii	1,182	77	145	376	1,085	15,332	2.75	36	142	369	1,181	7,998	2.49
Iowa	1,147	184	637	815	2,479	17,411	2.25	65	639	836	2,447	12,922	2.33
Idaho	1,177	74	326	448	1,572	6,337	1.91	66	318	459	1,589	4,099	1.84
Illinois	5,200	141	590	800	1,916	19,429	2.35	184	608	830	1,944	16,316	2.30
Indiana	1,394	135	906	1,393	3,414	70,697	2.94	98	849	1,344	3,427	44,346	3.07
Kansas	1,199	126	520	738	2,060	15,499	2.41	68	521	749	1,976	24,240	2.65
Kentucky	1,200	149	834	1,068	2,883	22,826	2.46	61	761	1,068	2,522	19,260	2.67
Louisiana	1,130	220	975	1,544	3,315	23,015	2.23	99	966	1,483	3,333	30,944	2.35
Massachusetts	1,435	224	1,010	1,346	3,579	24,748	2.47	71	928	1,368	4,125	34,850	2.63
Maryland	1,160	253	1,024	1,422	2,964	33,214	2.84	132	993	1,437	3,383	28,007	2.78
Maine	1,110	48	266	451	1,663	6,262	1.89	26	277	456	1,673	5,318	1.85
Michigan	4,707	119	526	670	1,929	20,498	2.13	69	535	711	1,946	10,978	2.08
Minnesota	1,104	243	1,110	1,415	3,797	32,529	2.30	132	1,072	1,454	3,959	21,190	2.34
Missouri	1,238	235	1,082	1,470	3,971	24,270	2.36	70	1,042	1,515	4,036	42,584	2.62

¹ Weight1*...*Weight10, Weight1*...*Weight11 used demographic variables from screener data; PS poststratification.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

(continued)(continued)

Table I.2 2000 NHSDA (Selected) Person Level Weight Summary Statistics: United States, District of Columbia, and the 50 States (continued)

Domain	n	Before res.per.ps (Weight1*...*Weight10) ¹						After res.per.ps (Weight1*...*Weight11) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Mississippi	1,105	140	687	921	2,002	19,134	2.59	62	659	945	1,850	17,094	2.74
Montana	1,129	83	198	290	1,299	5,540	1.97	41	189	290	1,241	3,883	2.10
North Carolina	1,342	231	1,217	1,755	4,960	35,852	2.96	328	1,161	1,777	4,705	37,769	3.01
North Dakota	1,116	48	162	197	889	2,932	1.98	18	164	209	882	2,212	1.96
Nebraska	1,171	113	380	514	1,985	10,817	1.95	34	383	568	2,007	8,610	1.92
New Hampshire	1,183	48	291	417	1,304	4,997	1.87	16	275	411	1,350	4,469	1.89
New Jersey	1,638	260	875	1,621	4,883	42,887	2.93	314	854	1,639	4,668	47,092	2.81
New Mexico	1,061	175	426	627	2,461	9,032	1.97	156	433	638	2,211	18,635	2.12
Nevada	1,188	117	344	609	2,214	11,242	2.10	43	331	631	2,107	12,387	2.17
New York	4,732	359	905	1,296	3,095	38,248	2.41	193	903	1,413	3,200	31,490	2.44
Ohio	4,651	101	611	804	2,008	29,042	2.38	50	610	835	2,071	17,230	2.29
Oklahoma	1,257	145	605	927	2,090	26,242	2.92	60	567	905	2,094	24,927	3.01
Oregon	1,069	275	741	1,014	2,269	81,874	3.42	185	753	1,073	2,181	26,346	2.81
Pennsylvania	5,117	117	511	795	2,157	18,155	2.46	59	522	810	2,034	24,040	2.51
Rhode Island	1,269	43	173	259	1,169	5,631	2.04	27	170	258	1,171	7,830	2.17
South Carolina	1,101	245	834	1,233	3,370	36,704	2.39	127	822	1,251	3,515	21,325	2.29
South Dakota	1,077	60	195	262	1,006	3,773	1.78	29	206	273	1,034	2,881	1.81
Tennessee	1,172	207	1,073	1,628	3,982	51,395	2.85	92	961	1,631	3,989	37,982	2.86
Texas	4,884	217	954	1,424	2,854	115,045	3.40	90	938	1,469	2,761	50,566	3.12
Utah	1,234	180	449	713	2,040	13,435	2.05	107	423	706	1,956	17,278	2.15
Virginia	1,322	224	1,018	1,835	4,960	57,519	2.86	115	1,029	1,806	5,362	31,120	2.56
Vermont	1,200	30	120	173	813	2,560	2.03	9	123	176	805	2,216	2.08
Washington	1,244	360	954	1,632	3,400	34,691	2.80	163	909	1,628	3,723	40,090	2.85
Wisconsin	1,424	242	702	1,372	3,401	26,031	2.54	191	745	1,387	3,094	21,496	2.57
West Virginia	1,176	83	353	621	2,521	9,748	1.86	81	361	622	2,465	7,879	1.93
Wyoming	1,037	35	125	196	690	3,183	2.02	30	124	201	696	2,020	1.92

¹ Weight1*...*Weight10, Weight1*...*Weight11 used demographic variables from screener data; PS poststratification.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

(continued)

Table I.3 2000 NHSDA (Respondent) Person Level Weight Summary Statistics: United States, District of Columbia, and the 50 States

Domain	n	Before res.per.nr (Weight1*...*Weight11) ¹						After res.per.nr (Weight1*...*Weight12) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
United States	71,764	10	580	1,000	2,149	59,010	3.45	10	700	1,251	2,806	85,218	3.89
Alaska	833	40	154	236	651	2,841	1.99	40	175	296	821	6,379	2.25
Alabama	936	65	823	1,246	2,845	36,666	3.18	65	922	1,507	3,444	76,788	3.78
Arkansas	960	59	520	718	2,913	10,230	2.25	115	598	848	3,726	18,941	2.40
Arizona	927	198	1,017	1,481	2,712	26,760	2.71	200	1,192	1,803	3,663	48,202	3.24
California	5,022	217	821	1,456	3,165	59,010	3.44	231	1,010	1,866	4,098	85,218	4.08
Colorado	911	84	843	1,274	2,790	23,193	2.59	85	1,123	1,761	3,608	36,514	2.77
Connecticut	891	85	552	852	2,474	20,015	2.44	85	789	1,284	3,220	31,221	2.53
District of Columbia	918	18	102	180	580	3,477	2.25	18	121	215	675	3,240	2.26
Delaware	928	18	141	223	767	2,997	2.08	19	176	288	1,167	5,099	2.30
Florida	3,478	143	744	1,038	2,445	21,834	2.77	150	851	1,271	3,143	33,585	3.01
Georgia	1,145	127	801	1,599	3,432	36,044	3.32	130	979	1,981	4,546	68,048	3.83
Hawaii	945	43	142	352	1,127	7,998	2.60	43	156	394	1,538	9,667	2.66
Iowa	921	82	641	838	2,460	12,922	2.30	101	756	1,123	2,765	16,658	2.38
Idaho	894	128	315	451	1,569	3,840	1.86	147	396	602	2,020	6,192	1.90
Illinois	3,660	184	587	784	1,772	16,316	2.38	185	759	1,133	2,640	23,739	2.61
Indiana	1,061	98	839	1,294	3,151	44,346	3.13	104	1,036	1,644	4,336	45,854	3.38
Kansas	897	68	515	747	1,880	15,310	2.55	68	635	1,023	2,854	22,799	2.76
Kentucky	1,018	61	755	1,066	2,522	19,260	2.67	61	849	1,276	3,105	35,939	2.77
Louisiana	939	99	937	1,391	3,190	30,944	2.45	158	1,100	1,694	4,138	34,833	2.48
Massachusetts	1,002	71	895	1,334	3,862	25,104	2.54	71	1,185	1,903	5,656	41,586	2.72
Maryland	967	132	976	1,372	3,091	26,083	2.85	133	1,099	1,699	3,723	43,909	3.29
Maine	901	26	274	445	1,644	5,318	1.88	26	330	537	2,009	5,520	1.93
Michigan	3,576	69	526	694	1,892	10,978	2.13	69	665	932	2,581	14,196	2.22
Minnesota	893	132	1,063	1,433	3,956	21,190	2.37	132	1,210	1,788	5,167	31,064	2.42
Missouri	893	85	1,030	1,509	3,883	42,584	2.71	129	1,357	2,095	5,552	60,174	2.82

¹ Weight1*...*Weight12 used demographic variables from screener data; NR nonresponse adjustment.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

(continued)

Table I.3 2000 NHSDA (Respondent) Person Level Weight Summary Statistics: United States, District of Columbia, and the 50 States (continued)

Domain	n	Before res.per.nr (Weight1*...*Weight11) ¹						After res.per.nr (Weight1*...*Weight12) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Mississippi	917	62	631	916	1,748	17,094	2.78	62	709	1,080	2,126	31,662	3.10
Montana	914	41	189	288	1,240	3,883	2.10	61	224	353	1,468	5,849	2.18
North Carolina	1,043	328	1,146	1,734	4,392	36,043	3.08	330	1,449	2,173	5,728	68,755	3.33
North Dakota	896	18	163	208	873	2,109	1.95	18	191	254	1,039	4,210	2.06
Nebraska	906	34	372	531	1,964	8,610	1.98	37	443	688	2,485	14,130	2.19
New Hampshire	883	16	270	411	1,389	4,368	1.89	17	361	604	1,834	6,068	1.89
New Jersey	1,200	314	823	1,419	3,876	43,566	2.90	343	1,016	1,902	5,959	51,461	3.14
New Mexico	874	156	427	621	2,115	18,635	2.15	156	484	765	2,684	23,043	2.24
Nevada	925	43	321	591	1,869	12,387	2.28	45	368	735	2,573	11,474	2.31
New York	3,589	193	898	1,386	2,999	31,490	2.48	199	1,154	1,756	4,182	33,233	2.55
Ohio	3,678	50	602	806	2,000	17,230	2.32	50	739	1,022	2,555	28,998	2.48
Oklahoma	973	60	567	889	1,945	24,927	3.03	61	685	1,152	2,564	31,031	3.32
Oregon	864	185	742	1,056	2,037	26,346	2.84	230	855	1,289	2,479	40,052	3.32
Pennsylvania	3,997	59	514	781	1,719	24,040	2.58	60	624	954	2,323	22,807	2.78
Rhode Island	950	29	170	257	1,147	7,830	2.19	34	223	370	1,385	7,749	2.35
South Carolina	855	127	821	1,259	3,491	17,122	2.30	132	1,031	1,622	4,412	22,669	2.32
South Dakota	855	29	202	269	1,003	2,881	1.83	29	249	340	1,282	3,934	1.93
Tennessee	947	92	892	1,575	3,758	37,982	2.81	92	944	1,835	4,151	85,104	3.68
Texas	4,020	90	913	1,428	2,607	50,566	3.20	109	1,064	1,697	3,258	69,889	3.54
Utah	1,031	107	423	706	1,917	17,278	2.18	121	506	813	2,156	17,278	2.20
Virginia	1,047	115	1,019	1,742	5,022	31,120	2.62	115	1,218	2,175	6,634	55,941	2.83
Vermont	981	10	119	173	805	2,215	2.11	10	139	209	979	3,557	2.13
Washington	1,006	177	907	1,601	3,493	40,090	2.92	195	1,057	1,890	4,328	64,296	3.32
Wisconsin	1,119	191	727	1,338	2,724	21,496	2.69	219	900	1,654	3,554	33,517	2.80
West Virginia	950	81	354	596	2,369	7,879	1.99	81	427	704	2,870	10,534	2.07
Wyoming	828	30	120	192	661	2,020	1.98	31	137	236	823	2,679	2.13

¹ Weight1*...*Weight12 used demographic variables from screener data; NR nonresponse adjustment.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

Table I.4 2000 NHSDA (Respondent) Person Level Weight Summary Statistics: United States, District of Columbia, and the 50 States

Domain	n	Before res.per.ps (Weight1*...*Weight12) ¹						Final Weight After res.per.ps (Weight1*...*Weight13) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
United States	71,764	10	700	1,251	2,806	85,218	3.89	4	693	1,263	2,817	79,705	3.88
Alaska	833	40	175	296	821	6,379	2.25	18	186	296	785	3,380	2.17
Alabama	936	65	922	1,507	3,444	76,788	3.78	21	949	1,579	3,443	57,051	3.66
Arkansas	960	115	598	848	3,726	18,941	2.40	66	592	827	3,759	14,771	2.38
Arizona	927	200	1,192	1,803	3,663	48,202	3.24	215	1,221	1,857	3,529	54,460	3.24
California	5,022	231	1,010	1,866	4,098	85,218	4.08	82	1,021	1,861	4,269	79,705	4.00
Colorado	911	85	1,123	1,761	3,608	36,514	2.77	58	1,115	1,752	3,633	34,765	2.77
Connecticut	891	85	789	1,284	3,220	31,221	2.53	51	757	1,252	3,529	21,151	2.41
District of Columbia	918	18	121	215	675	3,240	2.26	7	118	218	618	4,283	2.36
Delaware	928	19	176	288	1,167	5,099	2.30	7	172	291	1,122	4,479	2.30
Florida	3,478	150	851	1,271	3,143	33,585	3.01	47	882	1,275	3,148	38,854	3.02
Georgia	1,145	130	979	1,981	4,546	68,048	3.83	54	975	1,942	4,599	57,999	3.85
Hawaii	945	43	156	394	1,538	9,667	2.66	14	185	402	1,363	7,896	2.67
Iowa	921	101	756	1,123	2,765	16,658	2.38	51	740	1,094	2,851	16,630	2.40
Idaho	894	147	396	602	2,020	6,192	1.90	32	396	594	2,047	6,824	1.91
Illinois	3,660	185	759	1,133	2,640	23,739	2.61	69	771	1,157	2,607	26,193	2.61
Indiana	1,061	104	1,036	1,644	4,336	45,854	3.38	56	1,056	1,700	4,134	60,129	3.47
Kansas	897	68	635	1,023	2,854	22,799	2.76	34	649	1,044	2,828	38,046	3.01
Kentucky	1,018	61	849	1,276	3,105	35,939	2.77	59	866	1,334	3,079	31,730	2.75
Louisiana	939	158	1,100	1,694	4,138	34,833	2.48	94	1,109	1,722	4,098	30,080	2.40
Massachusetts	1,002	71	1,185	1,903	5,656	41,586	2.72	20	1,238	1,946	5,699	57,338	2.77
Maryland	967	133	1,099	1,699	3,723	43,909	3.29	87	1,116	1,708	3,644	48,108	3.28
Maine	901	26	330	537	2,009	5,520	1.93	7	327	551	2,012	5,686	1.95
Michigan	3,576	69	665	932	2,581	14,196	2.22	60	674	929	2,484	21,144	2.21
Minnesota	893	132	1,210	1,788	5,167	31,064	2.42	29	1,273	1,874	4,838	38,613	2.44
Missouri	893	129	1,357	2,095	5,552	60,174	2.82	74	1,346	2,072	5,242	45,241	2.82

¹ Weight1*...*Weight13, used demographic variables from questionnaire data; PS post-stratification;

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.

(continued)

Table I.4 2000 NHSDA (Respondent) Person Level Weight Summary Statistics: United States, District of Columbia, and the 50 States (continued)

Domain	n	Before res.per.ps (Weight1*...*Weight12) ¹						Final Weight After res.per.ps (Weight1*...*Weight13) ¹					
		Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Mississippi	917	62	709	1,080	2,126	31,662	3.10	159	701	1,122	2,134	24,520	3.00
Montana	914	61	224	353	1,468	5,849	2.18	14	233	356	1,454	5,673	2.21
North Carolina	1,043	330	1,449	2,173	5,728	68,755	3.33	124	1,470	2,261	5,767	63,062	3.33
North Dakota	896	18	191	254	1,039	4,210	2.06	23	197	263	1,010	4,644	2.06
Nebraska	906	37	443	688	2,485	14,130	2.19	52	428	684	2,580	8,791	2.05
New Hampshire	883	17	361	604	1,834	6,068	1.89	5	358	606	1,799	6,130	1.89
New Jersey	1,200	343	1,016	1,902	5,959	51,461	3.14	134	959	1,944	5,944	48,203	3.19
New Mexico	874	156	484	765	2,684	23,043	2.24	42	487	781	2,665	11,633	2.13
Nevada	925	45	368	735	2,573	11,474	2.31	32	347	723	2,566	11,301	2.35
New York	3,589	199	1,154	1,756	4,182	33,233	2.55	44	1,158	1,761	4,436	42,087	2.59
Ohio	3,678	50	739	1,022	2,555	28,998	2.48	59	735	1,032	2,585	17,897	2.47
Oklahoma	973	61	685	1,152	2,564	31,031	3.32	52	656	1,180	2,501	34,164	3.22
Oregon	864	230	855	1,289	2,479	40,052	3.32	261	861	1,389	2,460	39,322	3.32
Pennsylvania	3,997	60	624	954	2,323	22,807	2.78	14	623	971	2,330	25,375	2.76
Rhode Island	950	34	223	370	1,385	7,749	2.35	11	215	367	1,420	9,626	2.35
South Carolina	855	132	1,031	1,622	4,412	22,669	2.32	47	1,027	1,645	4,441	21,978	2.30
South Dakota	855	29	249	340	1,282	3,934	1.93	18	241	343	1,248	3,663	1.96
Tennessee	947	92	944	1,835	4,151	85,104	3.68	103	990	1,860	4,287	62,806	3.47
Texas	4,020	109	1,064	1,697	3,258	69,889	3.54	100	1,062	1,706	3,315	52,829	3.51
Utah	1,031	121	506	813	2,156	17,278	2.20	67	498	792	2,250	17,278	2.36
Virginia	1,047	115	1,218	2,175	6,634	55,941	2.83	70	1,200	2,129	6,340	45,129	2.81
Vermont	981	10	139	209	979	3,557	2.13	4	137	220	1,001	3,680	2.12
Washington	1,006	195	1,057	1,890	4,328	64,296	3.32	149	1,057	1,875	4,207	62,931	3.36
Wisconsin	1,119	219	900	1,654	3,554	33,517	2.80	159	889	1,665	3,598	58,963	2.98
West Virginia	950	81	427	704	2,870	10,534	2.07	53	433	729	2,877	8,240	2.05
Wyoming	828	31	137	236	823	2,679	2.13	8	137	256	763	3,681	2.20

¹ Weight1*...*Weight13, used demographic variables from questionnaire data; PS post-stratification;

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ Unequal weighting effect defined as $1 + ((n-1)/n) * CV^2$ where CV=coefficient of variation of weights.